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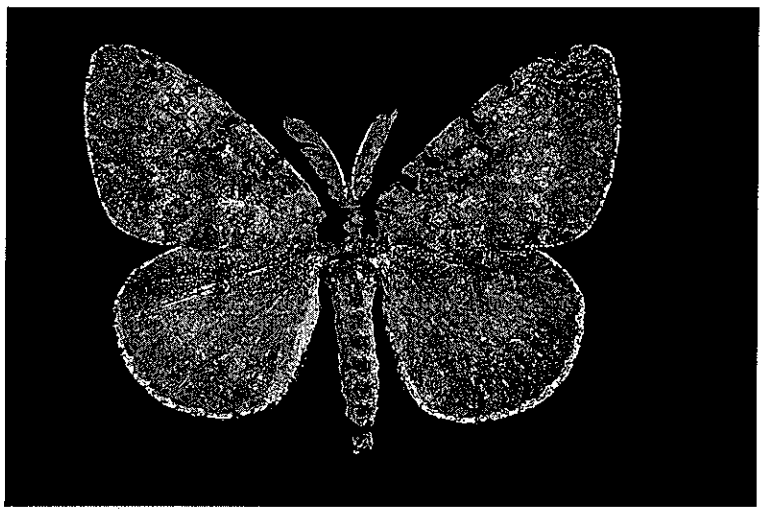
ENVIRONMENTAL ASSESSMENT

COOPERATIVE GYPSY MOTH ERADICATION PROJECT
KING COUNTY
WASHINGTON

MARCH 6, 2006



Prepared by
Washington State Department of Agriculture
Plant Protection Division

In cooperation with
United States Department of Agriculture
Animal and Plant Health Inspection Service
Plant Protection and Quarantine

Published for the 2006 Gypsy Moth Eradication Season
Washington State Department of Agriculture
Plant Protection Division
3939 Cleveland Ave. SE
Olympia WA 98501
1-800 443-6684

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I. PURPOSE AND NEED FOR ACTION

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1. Introduction

The Washington State Department of Agriculture (WSDA), in cooperation with the United States Department of Agriculture Animal and Plant Health Inspection Service (USDA-APHIS), is proposing an eradication program with the goal of eliminating two isolated infestations of the non-native gypsy moth, Lymantria dispar (Linnaeus), in King County, Washington in the spring of 2006.

2. Environmental Analysis and Documentation

In 1995, the USDA Forest Service and APHIS prepared a final environmental impact statement, "Gypsy Moth Management in the United States: a cooperative approach", (hereinafter referred to as FEIS), which described and analyzed methods of gypsy moth control available for use in USDA cooperative programs. WSDA is proposing nothing that was not analyzed in the 1995 FEIS. Therefore, a new programmatic environmental impact statement will not be required.

This Environmental Assessment (EA) is "tiered" to the FEIS in accordance with the Council on Environmental Quality regulations for implementing the National Environmental Policy Act of 1969 (NEPA) (40 CFR 1502.20 and 40 CFR 1508.28). This EA provides the basic background information necessary for the site-specific analysis of the potential environmental effects of WSDA's proposed 2006 Cooperative Gypsy Moth Eradication Project. The FEIS and this site-specific EA jointly constitute the environmental analysis and documentation required under NEPA.

Copies of the FEIS and the EA are available for review at:

Washington State Library
6880 Capitol Blvd. S
Tumwater, WA 98501

and

USDA, APHIS, PPQ
APHIS Library, 1st floor
4700 River Road
Riverdale, MD 20737

and

USDA, APHIS, PPQ
22000 Marine View Drive S., Suite 201
Des Moines, WA 98198

Additional environmental analysis and documentation has been prepared to satisfy Washington State requirements under Chapter 43.21 (c) of the Revised Code of Washington (State Environmental Policy Act or SEPA), and Chapter 197-11 of the Washington Administrative Code (SEPA rules).

Copies of the SEPA documentation are available for review at:

Washington State Library
6880 Capitol Blvd. S
Tumwater, WA 98501

3. History and Scope of Project

Since its accidental release in the United States in 1869, the European strain of gypsy moth has spread throughout New England and areas to the north, south and west. It has become established in all or parts of 19 states, the District of Columbia, and parts of Canada. It continues to spread to uninfested areas. The gypsy moth has caused dramatic economic, social, and ecological impacts throughout the infested area (USDA, 1995, vol. II, chapter 1, p. 4).

The European strain of the gypsy moth has been found every year in Washington State since 1974 with the exceptions of 1976 and 1977. The European gypsy moth is usually introduced to Washington State by people visiting or relocating from the infested area of eastern North America. For more than 25 years, WSDA has successfully detected and eradicated new introductions of gypsy moth.

In 1991, the Asian strain of the gypsy moth was found for the first time in Oregon, Washington, and in British Columbia, Canada. Eradication projects conducted in 1992 successfully eliminated the insect from those areas. WSDA has detected and treated introductions of the Asian strain of the gypsy moth in 1991-92, 1994-95, 1995-96, 1996-97, 1997-98 and 1999-2000. These eradication projects have been successful. The Asian strain poses a far greater risk of rapid spread than the European. Unlike females of the European strain, females of the Asian strain may fly and deposit an egg mass miles from where they feed as caterpillars. The Asian strain also poses a greater risk of damage because it feeds on a greater variety of plants (USDA, 1995, vol. II, chapter 1, p. 4).

For more information on how the different strains/populations of the gypsy moth are to be treated please see USDA, 1995, vol. II, chapter 1, pp. 9-11.

4. Decisions to be made

There are three significant decisions, which must be made as a part of evaluating a gypsy moth control action.

The first decision to be made is whether to propose a gypsy moth control project (the absence of a control project is a no-action alternative). The second decision to be made is whether or not tiering this environmental assessment to the USDA 1995 FEIS is appropriate. The third decision to be made is whether to proceed with the preferred alternative as described in the FEIS.

B. Proposed Action

Strategies described in the FEIS depend upon the infestation status of the area: generally infested, transition, or uninfested. The three strategies of suppression, eradication, and slow the spread -- or their absence – are included in the six alternatives described in the FEIS. The sixth alternative is the preferred alternative presented in the FEIS. The sixth alternative is comprised of all three strategies.

Based on the infestation status of "no established population" Washington State's strategy in 2006 will be eradication.

For a more detailed description of the alternatives described in the FEIS, please refer to an excerpt from the FEIS in Appendix B of this EA.

Treatments available for eradication projects include: (the biological insecticides) Bacillus thuringiensis var. kurstaki (B.t.k.) and the gypsy moth nucleopolyhedrosis virus (Gypchek); a chemical insecticide (diflubenzuron); and treatments employing mass trapping, mating disruption, and sterile insect release techniques. A detailed description of these treatments is available in Appendix A of the FEIS.

C. Need For Action

1. Economic, Social, and Ecological Impacts

In order to avoid undesirable economic, social, and ecological impacts to residents, communities and businesses in Washington State, WSDA in cooperation with USDA APHIS, proposes to eradicate two isolated infestations of European gypsy moth. One is in the Madison area of Seattle in King County and the second is in the Rosemont area of Bellevue in King County.

Trapping (utilizing pheromone-baited traps) and/or visual inspections for alternate life stages such as egg masses have detected gypsy moth infestations in the aforementioned areas. The gypsy moth is able to survive and reproduce in Washington State, as evidenced by numerous past isolated infestations. The current infestations, if left unchecked, could spread across large areas.

Trees in forests and orchards, and residential and municipal shade trees and landscape plantings would be damaged and killed. Recreational and aesthetic values associated with trees and forested land would be diminished (USDA, 1995, vol. II, chapter 2, p. 29). Species composition of the vegetation on forested land could change, affecting the quantity and variety of food available for wildlife (USDA, 1995, vol. II, chapter 2, p. 23).

Water quality could be adversely affected in a number of ways including: 1) increased siltation from rapid runoff of rainfall from defoliated areas; 2) increases in water temperature as it flows through areas made shadeless; and 3) nutrient overloading from the deposition of large quantities of caterpillar droppings (USDA, 1995, vol. II, chapter 2, pp. 24-25).

The pesticide load in the environment would likely increase in quantity, variety, and net detrimental environmental impact as home and business owners respond to ever-increasing numbers of gypsy moth caterpillars, the damage they cause, and the nuisance they represent (USDA, 1995, vol. II, chapter 4, p. 76).

Human health effects associated with the presence of large numbers of gypsy moth caterpillars have been reported, including rashes and welts typical of allergic reactions, and respiratory complaints. These effects have been attributed to the irritating nature of the bristles found on the caterpillars. In some instances the reactions have been severe enough to require medical attention (USDA, 1995, vol. III, chapter 3, pp. 2-3), (Allen et, al., 1991), (Tuthill, et al., 1984), (Aber, et al., 1982), (Beaucher and Farnham, 1982), (Shama, et al., 1982).

Agricultural, horticultural and forestry enterprises are dependent upon markets beyond the borders of Washington State. Washington must be able to comply with the plant pest and disease regulations of the Federal government, other states, and international markets. The establishment and spread of the gypsy moth in Washington State would result in the imposition of quarantines (USDA, 1995, vol. II, chapter 2, p. 29). The levels of production and value of plant products would be adversely affected.

2. Project Goals and Objectives

The WSDA, in cooperation with USDA-APHIS and other appropriate Federal, State and local agencies, proposes to take action to eradicate two isolated infestations of European gypsy moth. One site is in the Madison area of Seattle in King County and the other is in the Rosemont area of Bellevue in King County. The action will be designed to give the project the best chance for achieving the goal of eradicating the gypsy moth infestations while minimizing risks to human health as well as minimizing detrimental environmental consequences. This action will be taken in order to prevent the establishment and spread of this pest insect and thereby avoid the adverse economic, social, and ecological effects associated with large-scale gypsy moth infestations.

D. Authorizing Laws and/or Policies

1. State Authorizing Laws

WSDA has authority under Chapter 17.24 of the Revised Code of Washington, Insect Pests and Plant Diseases, to eradicate or control insect pests that may endanger the agricultural and horticultural industries in the state of Washington.

2. Federal Authorizing Laws

The USDA-APHIS has broad discretionary authority to prevent the establishment or spread of plant pests. See 1995 FEIS, volume 2, chapter 1, pages 8 and 9, "Statutory Authorities", for more information.

3. Environmental Laws and Other Regulations

Many environmental laws, authorities and Executive Orders of the President influence how actions to manage pests, including the gypsy moth, are implemented at the site-specific level. Such laws include the National Environmental Policy Act; the Washington State Environmental Policy Act; the Federal Insecticide, Fungicide, and Rodenticide Act; the Clean Water Act and the Endangered Species Act. See 1995 FEIS, volume 2, chapter 1, pages 8 and 9, "Statutory Authorities", for more information.

II. PUBLIC INVOLVEMENT AND ISSUES

A. Public Notification and Involvement

WSDA conducts on-the-ground inspections in early fall 2005. Washington State Department of Agriculture (WSDA) employees searched for egg masses and other evidence of gypsy moth activity in numerous communities where multiple moth catches had been made in summer 2005. During these inspections, contact was made with local residents. WSDA employees explained that gypsy moths had been caught in the neighborhood, and they were looking for other evidence of a reproducing population.

WSDA sends letters to locally elected officials in Madison and Rosemont on January 11, 2006. Officials receiving letters included the state senator and two state representatives from the 41st and 43rd legislative districts; King County Executive and members of the King County Council; and mayors and city council members of Seattle and Bellevue. The letters stated:

1. A reproducing population of gypsy moth had been located in the Madison and Rosemont communities.
2. WSDA is proposing to eradicate the infestation with a biological insecticide *Bacillus thuringiensis* var. *kurstaki (Btk)* in spring 2006.

3. WSDA will soon begin a public information campaign to inform local residents and community leaders of the Madison and Rosemont communities of the infestation and proposed treatment.

WSDA dispatches news release dispatched to local media January 17, 2006: The news release stated WSDA was proposing to treat a 100-acre site in the Madison area of Seattle and a 5.5-acre site in the Rosemont neighborhood of Bellevue in spring 2006. The purposes of the treatments were to prevent the European gypsy moth from becoming established in those communities. The news release also stated:

1. Before the proposal is approved, WSDA will prepare a State Environmental Policy Act (SEPA) checklist and National Environmental Policy Act (NEPA) environmental assessment for public review and comment, and consult with other state and federal agencies on the proposal.
2. Residents whose properties are located in the proposed treatment zones would receive a written invitation to attend a community open house in early February on the proposed treatment. At the open houses residents will be able to review display boards, pick up written information, view a videotape, and ask questions of entomologists about the proposed treatment.
3. Citizens are encouraged to call the WSDA toll-free hotline (1-800-443-6684) or visit the WSDA Web site (www.agr.wa.gov, click on "gypsy moth") if they had any questions on the proposed treatment.

Local media publicizes proposed treatment in late January 2006: News accounts appeared on local radio and TV in the Seattle and Bellevue. Also, balanced newspaper articles also appeared in the *Seattle Post-Intelligence* and *King County Journal (Bellevue edition),* both daily newspapers, on January 20 and January 22, respectively.

WSDA sends 21 letters to Rosemont residents living in or near the proposed treatment zones on January 26, 2006. The letters stated:

1. A reproducing population of gypsy moth exists in your neighborhood.
2. WSDA is proposing a series of treatments of a biological insecticide, *Bacillus thuringiensis* var. *kurstaki*, beginning in April or May to eradicate the destructive pest.
3. You are invited to an open house (details were contained in the letter) to learn more about the proposed treatment.
4. Please call WSDA's toll-free hotline (1-800-443-6684) or visit the WSDA web site at www.agr.wa.gov, click on gypsy moth, for more information.

Enclosed to the letter were a gypsy moth fact sheet and a map of the proposed treatment site.

WSDA sent approximately 4,000 brochures to Madison residents and businesses living in or near the proposed treatment zones on January 27, 2006. The brochure, which included an individual letter to the resident or business, contained the same information for the proposed Madison treatment as the letter for the Rosemont treatment.

WSDA dispatches an electronic email to 50 locally elected officials and community leaders in Seattle and Bellevue January 31, 2006: The email stated a community open house would be held in the Rosemont and Madison neighborhoods on February 7th and 9th respectively to:

1. Discuss strategies and treatments for addressing gypsy moth infestation in Washington
2. Discuss why eradication is the strategy selected to respond to infestations in Washington
3. Discuss the process used by WSDA to evaluate and propose a treatment
4. Inform the public of the opportunity to comment on the SEPA and NEPA documents.

WSDA holds community open house in Rosemont on February 7, 2006. The open house was held in the library at Bennett Elementary School. The event was organized as follows: Six stations were set up in the school library. Subject matter experts from WSDA or Seattle-King County Public Health officials were present at each site to provide information and answer questions. The six stations were:

1. Details of the WSDA 2005 gypsy moth summer trapping program
2. Details of boundaries of WSDA's proposed treatment site.
3. Details of the process WSDA follows in proposing, evaluating, and deciding whether a proposal to treat will take place.
4. WSDA reference material table where attendees with technical questions could get answers
5. State Department of Health/Seattle-King County Public Health station where questions on the human health aspects of the proposal were answered
6. Station where attendees could view a 14-minute videotape on how the gypsy moth has expanded from a single house in Medford, Massachusetts in 1869 to more than 156 million acres today.

WSDA emphasized several major points at open houses:

1. Destructiveness of the gypsy moth
2. How the pest gets to Washington
3. How the pest damages the environment and the economy
4. Results of WSDA's summer trapping program
5. Evidence supporting the eradication proposal
6. Boundaries of the proposed treatment zone
7. Proven safety record of the pesticide proposed for use
8. The two environmental documents made available for public review and comment for an eradication proposal
9. The opportunity residents have to comment on the environmental documents
10. Treatments available to control gypsy moths
11. Why eradication is the best strategy for Washington.
12. Failure of early attempts in the late 1800s, 1900s to eradicate the moth
13. Where 82 treatments have been conducted in Washington

14. The process WSDA follows to deciding whether or not to conduct a treatment

Attendees also received a packet to take home with them containing the following handouts:

1. Why the gypsy moth is one of the worst pests ever brought into the U.S.
2. How the gypsy moth damages the environment
3. Purpose of gypsy moth open houses
4. Background data on the pesticide commonly used in eradication treatments
5. Washington State Department of Health fact sheet
6. Map of the proposed treatment zone
7. Map showing the spread of the gypsy moth in U.S. from 1900 to 2000
8. Photos of America's first major gypsy moth outbreak in 1889
9. Where 82 gypsy moth eradication treatments have been conducted in Washington since 1979
10. Advantages and disadvantages of six treatments available to WSDA to control gypsy moths
11. The eight steps WSDA goes through in deciding to conduct an eradication treatment
12. Why eradication is the best of four basic strategies for Washington

WSDA holds community open house in Madison on February 9, 2006. The open house was held in the cafeteria at Meany Middle School. The event was organized the same as the one at Rosemont.

B. Issues and Concerns

Concerns were raised about the proposed treatments, their effects on human health and on non-target organisms. Those issues raised are addressed in this EA and in the FEIS to which this EA is "tiered".

III. AFFECTED ENVIRONMENT

A. 2006 SITE DESCRIPTIONS (see Appendix C for maps)

Madison (Seattle South, WA 7.5X15 minute quadrangle, S28 T25N R4E)

- King County, Washington
- Approximately 100 acres
- Zoning
  SF 5000: Residential, Single Family 5000
  L-1: Residential, Single Family Lowrise 1
  L-2: Residential Single Family Lowrise 2
  L-3: Residential Single Family Lowrise 3
  NC2-40: Non-Commercial 2
  LDT: Residential, Multifamily, Lowrise Duplex/Triplex
- Approximately 600 properties in the proposed treatment area.
- Proposed Area
  The boundaries of the proposed site are: on the west, 21st Ave E.; on the east, Martin Luther King Jr. Way; on the north, E. Republican St.; and on the south, E. Howell St.
- Vegetation
  Canopy coverage is less than 10%, tree height is variable with deciduous trees in excess of 100 feet.
- Critical/Sensitive Areas
  Steep slopes (40% grade minimum)
  Potential Slide Area
  Known Slide Area
  Liquefaction Zone
- Catch History
  Two European Gypsy Moths were caught in the area during the 2003 summer survey.
  Six European Gypsy Moths were caught in the area during the 2004 summer survey.
  Five European Gypsy Moths were caught in the area during the 2005 summer survey.
- Alternate Life Stages
  None

Rosemont (Bellevue South, WA 7.5X15 minute quadrangle, S25 T25N R5E)

- King County, Washington
- Approximately 5.5 acres
- Zoning
  R-5: 5 Dwelling Unit per acre
- Approximately 18 properties in the proposed treatment area.
- Proposed Area
  The 5.5 acre proposed treatment site is centered near the intersection of 176th Ave NE and NE 13th St.
- Vegetation
  Canopy coverage is less than 10%, tree height is variable with deciduous trees in excess of 50 feet.
- Critical/Sensitive Areas
  Steep Slopes (minimum 15%)
- Catch History
  One European Gypsy Moth was caught in the area during the 2003 summer survey. Two European Gypsy Moths were caught in the area during the 2005 summer survey.
- Alternate Life Stages
  Two pupal cases were found in the area during the fall of 2005.

B. Threatened, Endangered, and Sensitive Species

As required by the Endangered Species Act of 1973, the USDA is taking part in section 7 consultation with both the United States Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries). In addition the WSDA has consulted with the Washington State Department of Fish and Wildlife (WDFW) and the Washington State Department of Natural Resources (DNR). These agencies provided maps or other data intended to aide in the identification of habitats of concern and the presence of listed, proposed, candidate, threatened or endangered species. See Appendix D.

The information provided by WDFW Priority Habitats and Species Program did not identify any threatened or endangered species on the **Madison** site, however, bald eagle nesting sites were listed as occurring in the area. All listed nesting sites are over one mile from the proposed site. Also, listed were two records of federal species of concern a western pond turtle (note: on State endangered species list) and a Peregrine Falcon nesting site both well over one half mile from proposed site. In addition, green heron were listed as nesting over one mile from proposed site. WDFW also listed the presence of priority anadromous fish including fall Chinook, coho salmon, sockeye salmon and winter steelhead. The priority resident fish listed include resident cutthroat and bull trout. The information provided by WDFW from their lepidopteran database found no butterfly species of concern in the immediate area or within a 5-mile radius of the area.

The information provided by WDFW Priority Habitats and Species Program did not identify any threatened or endangered species on the **Rosemont** site, however, one bald eagle nesting site was listed as occurring in the area. The listed nesting site is over one mile from the proposed site. WDFW also listed the presence of priority anadromous fish including coho salmon, sockeye salmon, fall chinook, winter steelhead and bull trout. The priority resident fish listed include resident cutthroat and kokanee salmon. The information provided by WDFW from their lepidopteran database found no butterfly species of concern in the immediate area or within a 5-mile radius of the area.

The DNR Washington Natural Heritage Program reviewed their Natural Heritage database. The DNR found no records for rare plants or high quality native ecosystems in the vicinity of this project. See Appendix D.

C. Other Environmental Consultation

The USDA is taking part in Endangered Species Act Section 7 consultation with both the United States Department of Interior Fish and Wildlife Sevice (USFWS) and the National Oceanic and Atmospheric Administation Fisheries Service (NOAA Fisheries).

IV. TREATMENT ALTERNATIVES

A. Treatment Alternatives

WSDA is proposing to conduct an Integrated Pest Management (IPM) program to eradicate gypsy moth in Washington State. Integrated Pest Management involves selecting those options and techniques that give the best chance of meeting the project goal of eradication. The FEIS contains a range of alternatives from which WSDA has selected an IPM strategy. The treatment alternatives detailed in the FEIS include:

1. Bacillus thuringiensis var. kurstaki (B.t.k.)
2. Diflubenzuron
3. Gypchek
4. Mass trapping
5. Mating disruption
6. Sterile release

B. Preferred Treatment Alternative

The WSDA/USDA-APHIS gypsy moth eradication project IPM strategy proposed for 2006 includes the use of the biological insecticide (B.t.k). Applications at the Madison site are expected to utilize Aerial application equipment due to the size and topography of the site however some areas could be treated using ground-based equipment. Ground-based equipment will be utilized at the Rosemont site. Ground-based applications may include the spreader-sticker Bond. Treatments will also include visual inspections for and removal of egg masses when found, and be followed up by delimitation trapping. This IPM strategy will give the project the best chance to achieve the goal of eradicating the gypsy moth infestations while minimizing risks to human health and minimizing detrimental environmental consequences. Details of the proposed ground and aerial applications follow:

Ground applications:

Ground-based applications will involve three-five treatments of Foray XG (EPA Reg. No. 73049-46) Bacillus thuringiensis var. kurstaki (B.t.k.) applied at label rate. The treatments would occur during the period between April 1 and June 30, 2006. Exact timing of the applications would be dependent on development of gypsy moth larvae and/or foliage as determined by WSDA.

A spreader-sticker (Bond) may be utilized, as an adjuvant at label rate. Mixing the formulation with adjuvants for gypsy moth eradication projects has been common practice (USDA, 1995, vol. II, A-4).

All ground applications will be conducted in accordance with all applicable federal, state, and local laws and regulations, and will adhere to the Standard Operating Procedures developed by WSDA for this project. See Appendix E.

Aerial applications:

Aerial applications will involve three-five treatments of Foray 48B (EPA Reg. No. 73049-46) Bacillus thuringiensis var. kurstaki (B.t.k.) applied at label rate. The treatments would occur during the period between April 1 and June 30, 2006. Exact timing of the applications would be dependent on development of gypsy moth larvae and/or foliage as determined by WSDA.

All aerial applications will be conducted in accordance with all applicable federal, state, and local laws and regulations, and will adhere to the Standard Operating Procedures developed by WSDA for this project. See Appendix E.
Follow up:

A follow up trapping program employing pheromone-baited traps in the summer of 2006 will contribute to the success of the eradication project by removing males from any residual population, delimiting the location of any residual populations of Gypsy moths, and aiding in the evaluation of the project.

In the event of multiple moth catches in a treatment area, visual inspections for alternate life stages (egg masses etc.) will be performed in the fall of 2006. Visual inspection will help determine if re-treatment actions should be considered.

C. Treatment Alternatives Not Selected

The remaining treatment alternatives available for this proposed eradication project, as outlined in the FEIS, were not selected due to lack of availability, unproven efficacy, or environmental/biological concerns (USDA, 1995, vol. II, pp. A3-10).

V. ENVIRONMENTAL CONSEQUENCES

A. Human Health and Safety

1. Bacillus thuringiensis var. (kurstaki) (B.t.k.)

The use of B.t.k. for the eradication of isolated gypsy moth infestations is expected to have no adverse impact on human health or the environment. Various strains of Bacillus thuringiensis (B.t.) are a naturally occurring bacterial component of soils worldwide. Modern aqueous formulations of B.t.k. used in gypsy moth control projects contain no organic solvents and have an excellent safety record associated with their use in gypsy moth suppression and eradication projects. An exemption from the requirement of a tolerance has been established for residues of B.t.k. in or on all raw agricultural commodities. This exemption stipulates that manufacturers of B.t.k. test each lot for pathogenicity and vertebrate toxicity. See Appendix F for each Sample Label and MSDS.

A detailed discussion of the human health effects of B.t.k. may be found in the 1995 FEIS vol. II, chapter 4, pp. 13-17, and in vol. III, chapter 4.

Due to advances in scientific knowledge, the law requires that pesticides which were first registered before November 1, 1984 be reregistered to ensure that they meet today's more stringent standards. In March of 1998 the United States Environmental Protection Agency came out with a Reregistration Eligibility Decision (EPA, 1998) in which they concluded:

> Based on the reviews of the generic data for the active ingredient *Bacillus thuringiensis*, the Agency has sufficient information on the health effects of *Bacillus thuringiensis* and on its potential for causing adverse effects in fish and wildlife and the environment. The Agency has determined that *Bacillus thuringiensis* products, manufactured, labeled and used as specified in this Reregistration Eligibility Decision, will not pose unreasonable risks or adverse effects to humans or the environment. Therefore, the Agency concludes that products containing *Bacillus thuringiensis* for all uses are eligible for reregistration (EPA, 1998).

In the spring of 1999, Foray 48B was applied by aircraft to 52 square miles of Southern Vancouver Island to combat an infestation of European gypsy moth. Approximately 80,000 residents lived in the spray zones. The Capital Health Region coordinated a human health study of possible short-term health effects. The resulting report (Capital Health Region, 1999) concluded:

> The results of this project did not show a relationship between aerial spraying of Foray 48B and short-term human health effects. Although some people self-reported health problems that they attributed to the spray program, the research and surveillance methods used in this project did not detect any change in health

status that could be linked to the spray program. Our results showed that many of the health complaints people reported during the spray were as common in people before the spray as they were shortly after the spray. This conclusion is consistent with those of previous studies of the possible health effects of B.t.k.-based pesticide spray programs.

Exposure to B.t.k. spray resulting from its use as proposed in this gypsy moth eradication project is unlikely to cause significant human health effects. However, it is good practice to minimize exposure to any insecticide. One of the conclusions reached in the Oregon study by Green, et al. (1990), was that, "the level of risk for B.t.k. and other existing or future microbial pesticides in immunocompromised hosts deserves further study."

2. Bond

Bond may be used during ground-based treatments as an adjuvant with the insecticide. Bond is a non-ionic spreader-sticker which acts as an adjuvant when mixed with insecticides. Bond is not an eye or primary skin irritant per the Federal Hazardous Substances Labeling Act. In the unlikely event that over exposure were to occur, local irritation might be possible, especially in sensitive individuals. Systemic toxic effects are unlikely. See Appendix F for a Sample Label and MSDS.

3. General Precautions

The WSDA will take the following additional steps to assist the public in avoiding or reducing exposure to the spray material:

1. The Pesticide Sensitive Individuals database, maintained by the Pesticide Management Division of the WSDA, will be checked for people living in or near the proposed treatment area who require advance notification.

2. The WSDA will offer a toll-free telephone line with information regarding scheduled treatment days.

3. The WSDA will provide notification calls the day before scheduled applications to any resident in the proposed treatment area requesting them.

4. During ground treatments WSDA on-site spray block monitors will notify residents before the actual application to their property.

5. During ground treatments WSDA on-site spray block monitors will notify bicyclists, joggers and other pedestrians that they are approaching the treatment area.

6. Information will be provided to residents of the treatment area about how to avoid or reduce exposure to the spray material.

B. Non-Target Organisms

1. Animals

Bacillus thuringiensis var. (kurstaki) (B.t.k.)

A detailed discussion of the ecological effects of B.t.k. on non-target organisms may be found in the 1995 FEIS vol. II, chapter 4, pp. 52-55, and in vol. IV, chapter 5, pp. 5-10.

As used in gypsy moth eradication projects, B.t.k. has not been shown to adversely affect fish, birds, mammals, or most non-target insects, including honey bees (USDA, 1995, vol. II, chapter 4, pp. 54-55). It is expected that B.t.k. may kill other lepidopteran larvae (leaf-eating caterpillars) if they are present in project areas when treatments occur. In turn, animals dependent on caterpillars as food theoretically may be affected. However, reductions in native caterpillar populations are expected to be temporary due to the brief residual effectiveness of B.t.k. deposits on foliage (4 to 10 days), the high reproductive capacity of most lepidoptera, and recolonization from adjacent untreated areas (USDA, 1995, vol. II, chapter 4, pp. 54-55). The small size of the proposed treatment areas should aid in the recolonization process.

A study conducted in Oregon in connection with gypsy moth control programs in 1986 and 1987 found reduced numbers of caterpillars immediately following B.t.k. treatments and reduced species diversity. This study also found that recovery in numbers of non-target caterpillars began the same season, but that recovery of species diversity lagged behind (Miller, 1990).

One study has shown that B.t.k. could interfere with the biological control of the noxious weed tansy ragwort by cinnabar moth larvae if applied to areas where the weed occurs when late-instar larvae are active (James, et al., 1993). However, an intentionally introduced species of flea beetle has more impact as the primary biological control agent on tansy ragwort (L.C. Burrill, et al. 1994). It is not anticipated that this proposed project would have any adverse impact on flea beetle populations.

Two studies examined the indirect effect of B.t.k. on the reproductive success of insectivorous birds through a possible reduction in food supply. The studies reported no significant differences between treated and untreated areas in numbers of eggs hatched or in nestling growth and development. When caterpillars weren't available, the birds switched to other available prey (Gaddis, 1987), (Gaddis and Corkran, 1986).

There is no evidence of significant adverse impacts of B.t.k. on aquatic organisms. In a study conducted on a benthic stream community there was no evidence that addition of B.t.k. to stream mesocosms created adverse effects for these communities even at greater than 100 times expected exposure rates (Richardson and Perrin, 1994).

2. Plants

Bacillus thuringiensis var. (kurstaki) (B.t.k.)

B.t.k. is non-toxic to plants. B.t.k. is sensitive to meteorological effects once it has been applied to plant surfaces. B.t.k. is readily removed from plant surfaces by rain and is rapidly degraded by sunlight (USDA, 1995, vol. IV, chapter 7, pp. 15). The use of Bond with ground-based equipment will help slow the removal and degradation of B.t.k. by both rain and sunlight.

Changes in soil productivity and fertility due to B.t.k. are not likely. B.t.k. persists for a relatively short time, B.t. is known to occur naturally in soils worldwide, and applications of insecticides containing B.t. do not appear to increase levels of B.t. in soil (USDA, 1995, vol. I, p. 19). For more information about the fate of B.t.k. in the soil refer to 1995 FEIS, vol. 4, chapter 7, p. 16.

3. Threatened, Endangered, and Sensitive Species

No threatened, endangered, or sensitive species are known to be in or near the proposed treatment sites. In reference to the species listed in the Affected Environment section of this EA all occur well outside of the proposed treatment sites. Therefore, it is not anticipated that the proposed use of B.t.k. would adversely effect these named species.

VI. MONITORING

During the treatment operation, a WSDA or USDA monitor will observe mixing and application of the spray material to ensure compliance with all federal, state, and local laws and regulations and adherence to the Standard Operating Procedures. See Appendix E.

The treatment sites will be intensively monitored in the summer of 2006 and 2007 using pheromone-baited traps to determine the effectiveness of the treatment, assist in the eradication and delimit any residual populations of gypsy moths. This monitoring may indicate a need for further action.

VII. CUMULATIVE EFFECTS

No cumulative effects due to the proposed action are anticipated.

VIII. SUMMARY

This EA has analyzed the potential environmental effects of the proposed WSDA and USDA APHIS treatment program. This analysis was based on the 1995 USDA FEIS entitled, "Gypsy Moth Management in the United States: a cooperative approach" and the preferred alternative strategy proposed by the Washington State Department of Agriculture and USDA-APHIS for eradicating Gypsy moths at two sites in Washington State. The WSDA/USDA-APHIS gypsy moth eradication project strategy proposed for 2006 includes the use of the biological insecticide (B.t.k.) and the spreader-sticker Bond during ground-based treatments, followed up by trapping, visual inspections and removal of egg masses where appropriate. It is believed that this IPM strategy will give the project the best chance of achieving the goal of eradicating the gypsy moth infestations while minimizing risks to human health and the environment.

To summarize:

A. B.t.k. used as described in this Environmental Assessment presents minimal risk of significant impact on human health.

B. It is not anticipated that any non-target animal or plant populations would be adversely affected due to the limited size of the treatment areas. Any detrimental effects on susceptible non-target organisms would be transient and these populations would recover as individuals from nearby untreated areas re-colonized the treatment areas.

C. No threatened, endangered, or sensitive species would be adversely affected by this eradication project.

D. No detrimental effects on vegetation, water, or soil are known or anticipated due to this eradication project.

E. No cumulative effects are known or anticipated.

IX. LIST OF AGENCIES AND PERSONS CONSULTED/NOTIFIED

Washington State Department of Health, Barbara Morrissey, for review of the proposed treatment with regard to human health concerns.

Seattle & King County Department of Public Health, Lee Dorigan, for review of the proposed treatment with regard to human healthy concerns.

Washington State Department of Natural Resources, Natural Heritage Program, Ms. Sandy Swope Moody, for review of the proposed treatment area for the presence of sensitive species or habitats.

Washington State Department of Fish and Wildlife, Ms. Lori Guggenmos, for review of the proposed treatment area for the presence of sensitive species or habitats.

Washington State Department of Fish and Wildlife, Ms. Ann Potter, for review of the proposed treatment area for the presence of sensitive lepidopteran species.

Washington State Department of Fish and Wildlife, Julie Stofel, for updated information on the presence of nesting eagles.

X. LIST OF PREPARERS

C. H. Phillips & J. L. Cena
Entomologists
Washington State Department of Agriculture
3939 Cleveland Ave. SE
Olympia, WA 98501
1-800-443-6684

XI. APPENDICES

A. References

B. Alternatives Described in 1995 FEIS

C. Treatment Site Maps

D. Letters received through interagency consultation concerning threatened, endangered, and sensitive species and habitats

E. Standard Operating Procedures

F. Product Labels & Material Safety Data Sheets

APPENDIX A

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APPENDIX B

Alternatives Described in 1995 FEIS

Alternative 1. No Suppression, No Eradication, No Slow the Spread

Under alternative 1, the Forest Service and APHIS would not suppress, eradicate, or slow the spread of the gypsy moth (*fig. 2-5*).

Implementation of alternative 1 would not reduce damage, prevent establishment, or slow the spread of the gypsy moth.

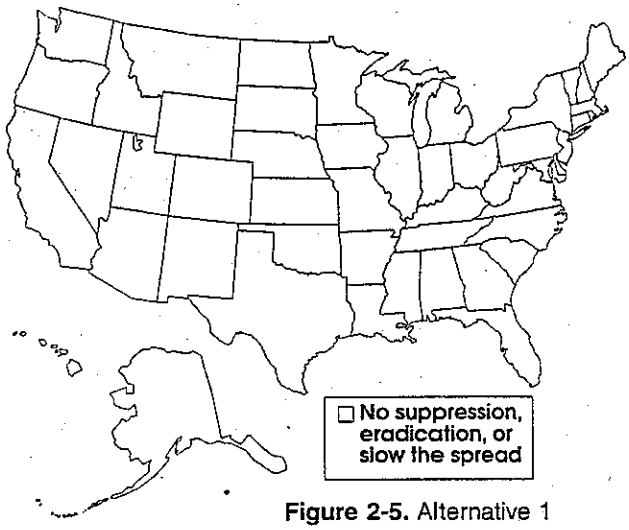


Figure 2-5. Alternative 1

Alternative 2. Suppression

Under alternative 2, the Forest Service could conduct suppression projects and cooperate with other Federal agencies and States to conduct suppression projects (*fig. 2-6*).

The Forest Service and APHIS would not slow the spread in the transition area, and neither would eradicate isolated infestations.

Implementation of alternative 2 would help reduce damage caused by the gypsy moth in the generally infested area.

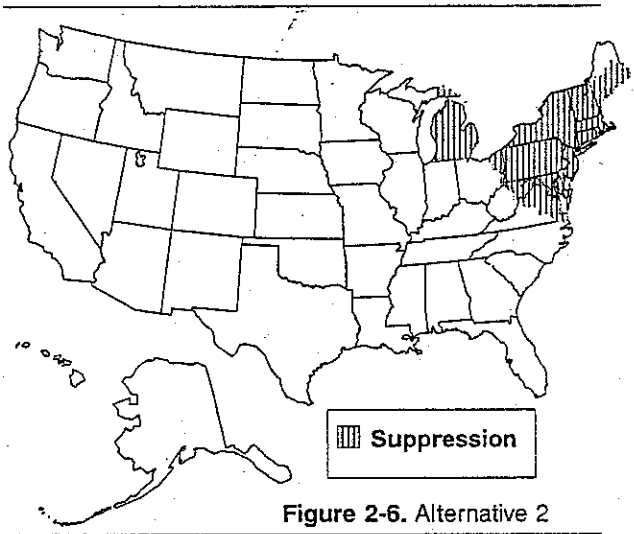


Figure 2-6. Alternative 2

Alternative 3. Eradication

Under alternative 3 the Forest Service and APHIS could conduct eradication projects and cooperate with other Federal agencies and States to conduct eradication projects (*fig. 2-7*).

The Forest Service would make no coordinated effort to suppress the gypsy moth in the generally infested area. The Forest Service and APHIS would not slow the spread in the transition area.

Implementation of alternative 3 would prevent establishment of gypsy moth populations in the uninfested area. The Asian strain of the gypsy moth would be eradicated wherever it is found, including the generally infested area when the source of the introduction is known.

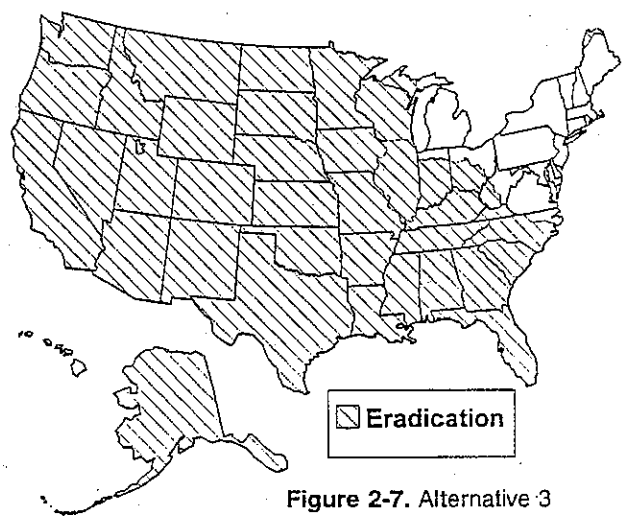


Figure 2-7. Alternative 3

Alternative 4. Suppression and Eradication

Under alternative 4 the Forest Service could conduct suppression projects and cooperate with other Federal agencies and States to conduct suppression projects. The Forest Service and APHIS could conduct eradication projects, and cooperate with other Federal agencies and States to conduct eradication projects (*fig. 2-8*). This alternative proposes the continuation of gypsy moth strategies currently being implemented. Alternative 4 represents the "no action" alternative in that it would be no change from the current program.

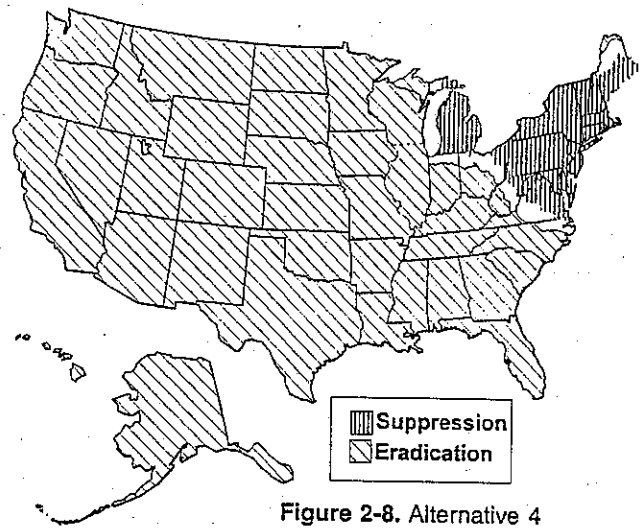


Figure 2-8. Alternative 4

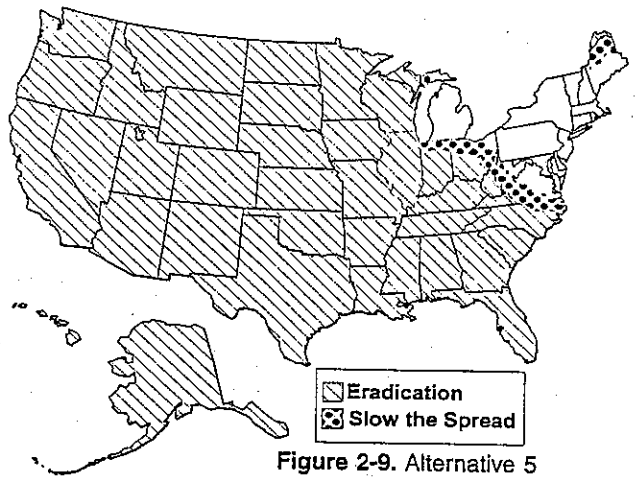


Figure 2-9. Alternative 5

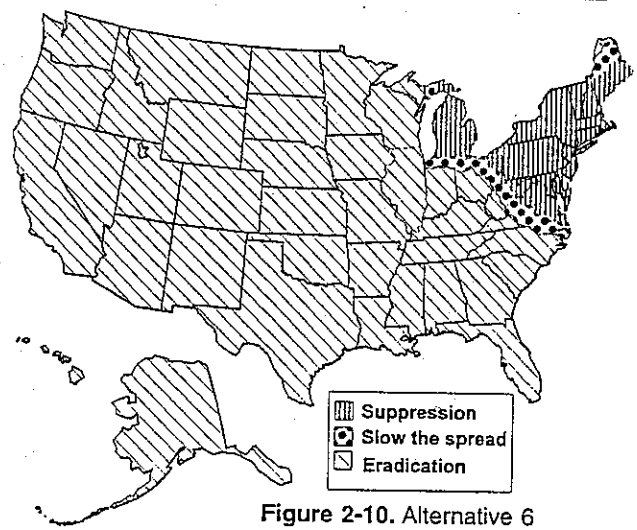


Figure 2-10. Alternative 6

USDA agencies would make no coordinated effort to reduce the rate of spread of the insect in the transition area.

Implementation of alternative 4 would reduce damage caused by the gypsy moth in the generally infested area and prevent establishment of gypsy moth populations in the uninfested area. The Asian strain of the gypsy moth would be eradicated wherever it is found, including the generally infested area when the source of the introduction is known.

Alternative 5. Eradication and Slow the Spread

Under alternative 5 the Forest Service and APHIS could conduct eradication and slow-the-spread projects, and cooperate with other Federal agencies and States to conduct eradication and slow-the-spread projects (*fig. 2-9*).

The Forest Service would make no coordinated effort to suppress outbreak populations of the gypsy moth in the generally infested area.

Implementation of alternative 5 would prevent establishment of gypsy moth populations in the uninfested area and slow the natural spread of the insect in the transition area. The Asian strain of the gypsy moth would be eradicated wherever it is found, including the generally infested area when the source of the introduction is known.

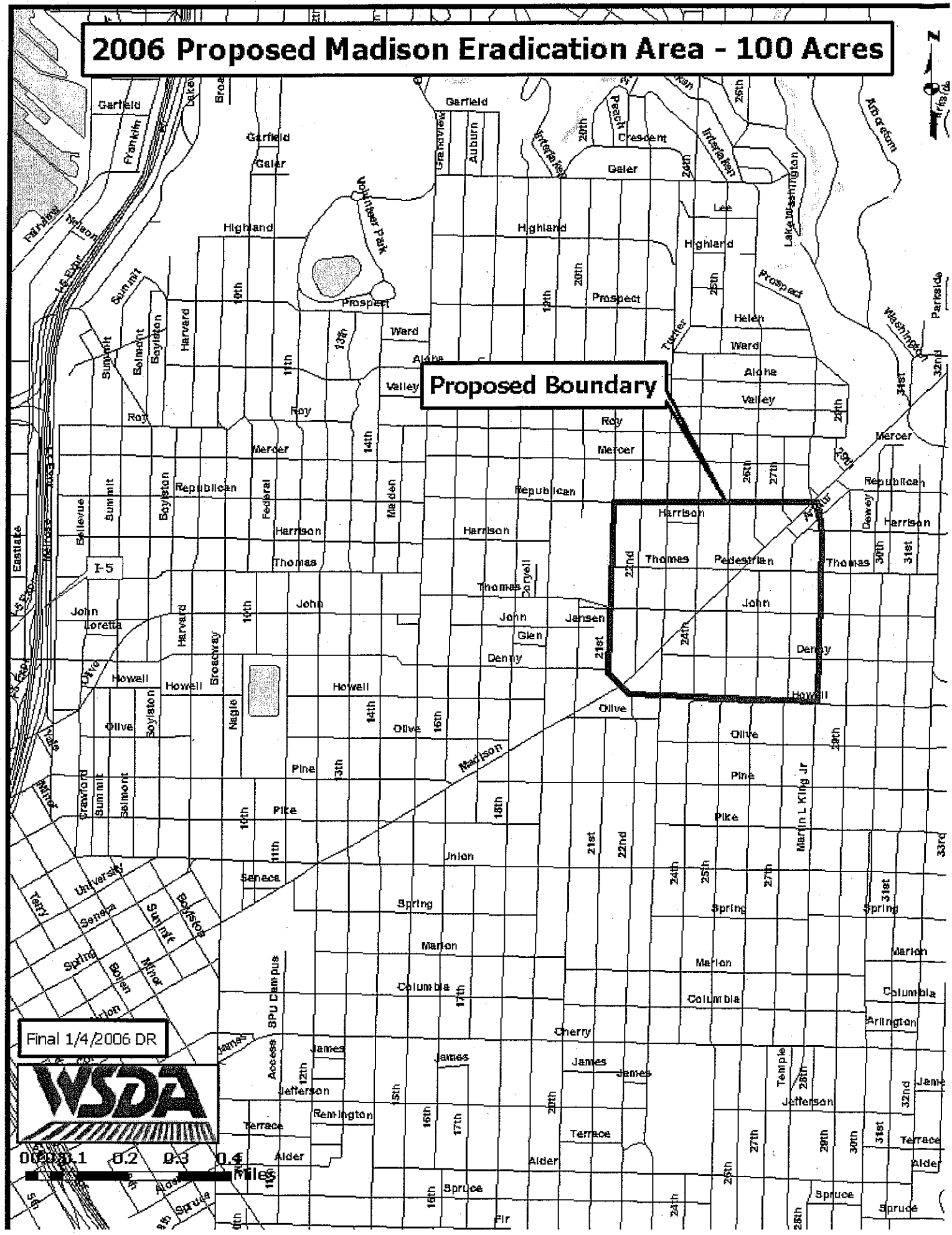
Alternative 6. Suppression, Eradication, and Slow the Spread (Preferred)

Under alternative 6 the Forest Service could conduct suppression projects, and cooperate with other Federal agencies and States to conduct suppression projects. The Forest Service and APHIS could conduct eradication and slow-the-spread projects and cooperate with other Federal agencies and States to conduct eradication and slow-the-spread projects (*fig. 2-10*). Alternative 6 is the preferred alternative.

Implementation of alternative 6 would help reduce damage in the generally infested area, prevent establishment of gypsy moth populations in the uninfested area, and slow the natural spread of the insect in the transition area. The Asian strain of the gypsy moth would be eradicated wherever it is found, including the generally infested area when the source of the introduction is known.

APPENDIX C

Treatment Site Maps


2006 Proposed Madison Eradication Area - 100 Acres
Proposed Boundary
Final 1/4/2006 DR
WSDA
0 0.1 0.2 0.3 0.4 Miles
N
Garfield
Galer
Highland
Prospect
Ward
Aloha
Valley
Roy
Mercer
Republican
Harrison
Thomas
John
Howell
Olive
Pine
Pike
Union
Seneca
Spring
Marion
Columbia
Cherry
James
Jefferson
Terrace
Alder
Spruce
Fir
I-5
Pedestrian
SPU Campus Access
Martin L King Jr
Madison
Broadway
Harvard
Summit
Belmont
Boylston
Federal
Malden
Nagle
Jansen
Glen
Denny
Caryell
Dewey
Lee
Helen
Tyler
Crawford
Bellevue
Eastlake
Fairview
Nelson
Franklin
Auburn
Crescent
Interlaken
Lake Washington
Prospect
Parkside
Terry
University
Seneca
Spring
Boren
Minor
Summit
Boylston
Temple
Jefferson
Remington
Terrace
Alder
Spruce
Fir


2006 Proposed Madison Eradication Area - 100 Acres
Proposed Boundary
Mercer
Republican
Harrison
Madison
Thomas
Pedestrian
John
Jansen
Denny
Howell
Olive
Pine
Archer
20th
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Final 1/4/2006 DR
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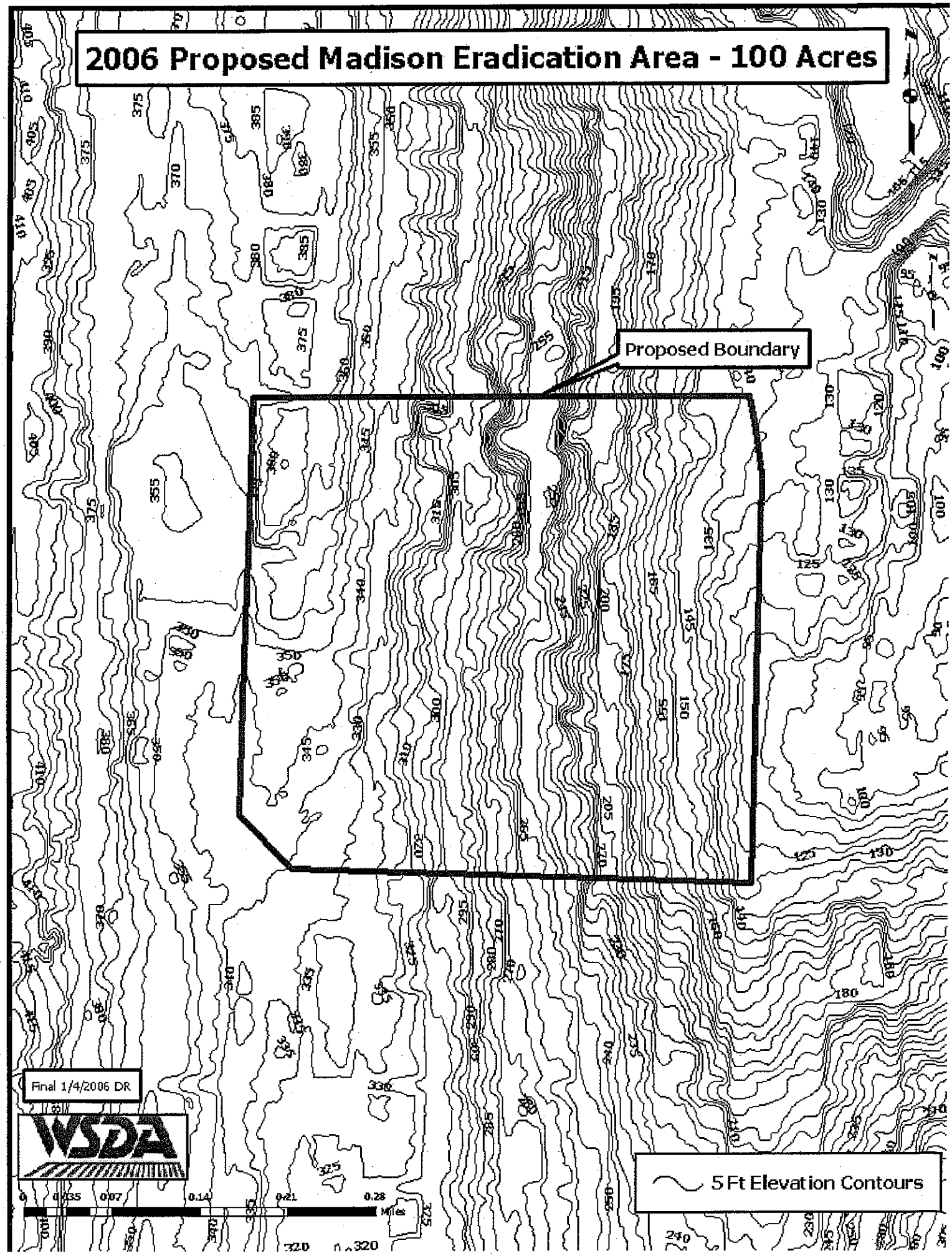
2006 Proposed Madison Eradication Area - 100 Acres
Proposed Boundary
Final 1/4/2006 DR
WSDA
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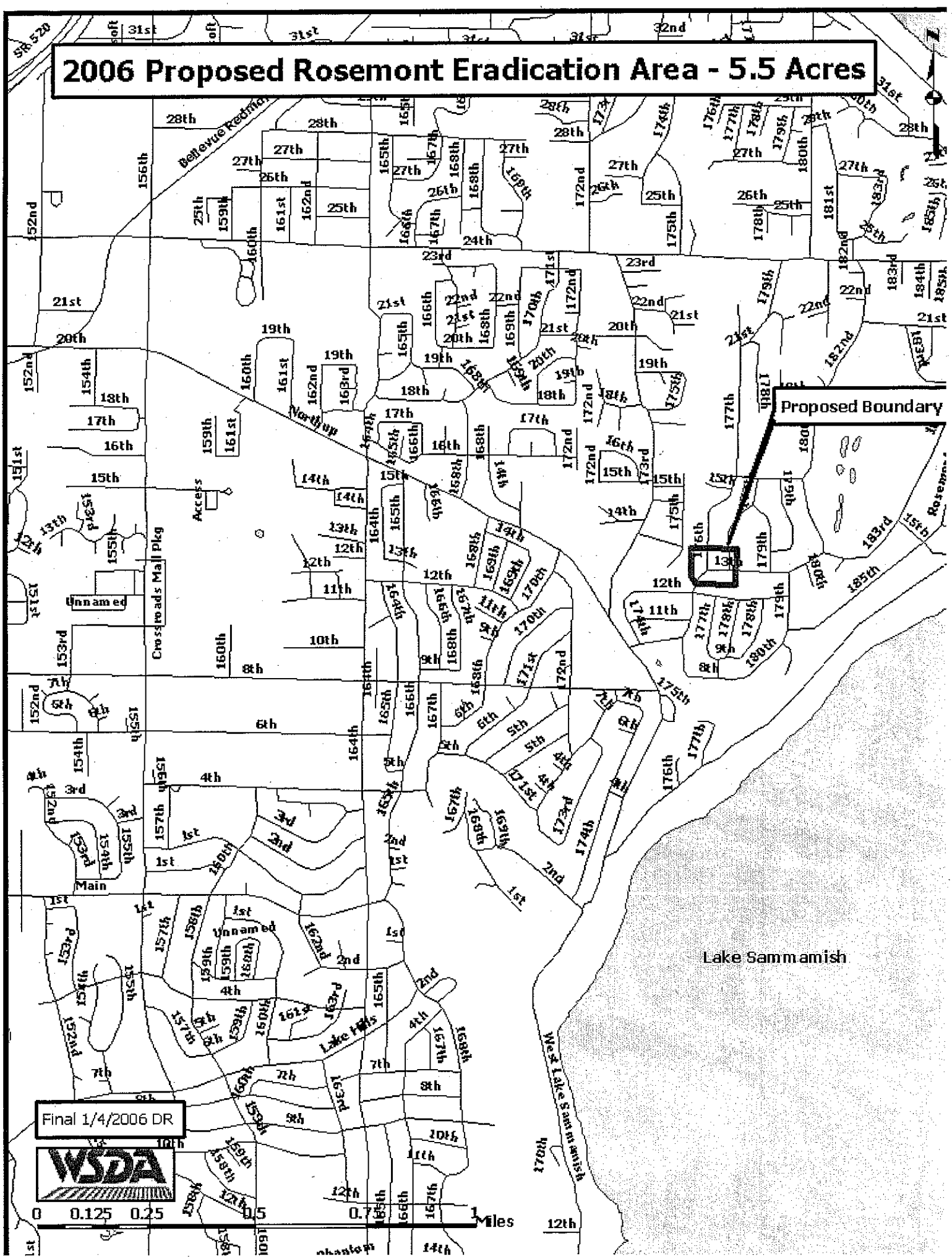
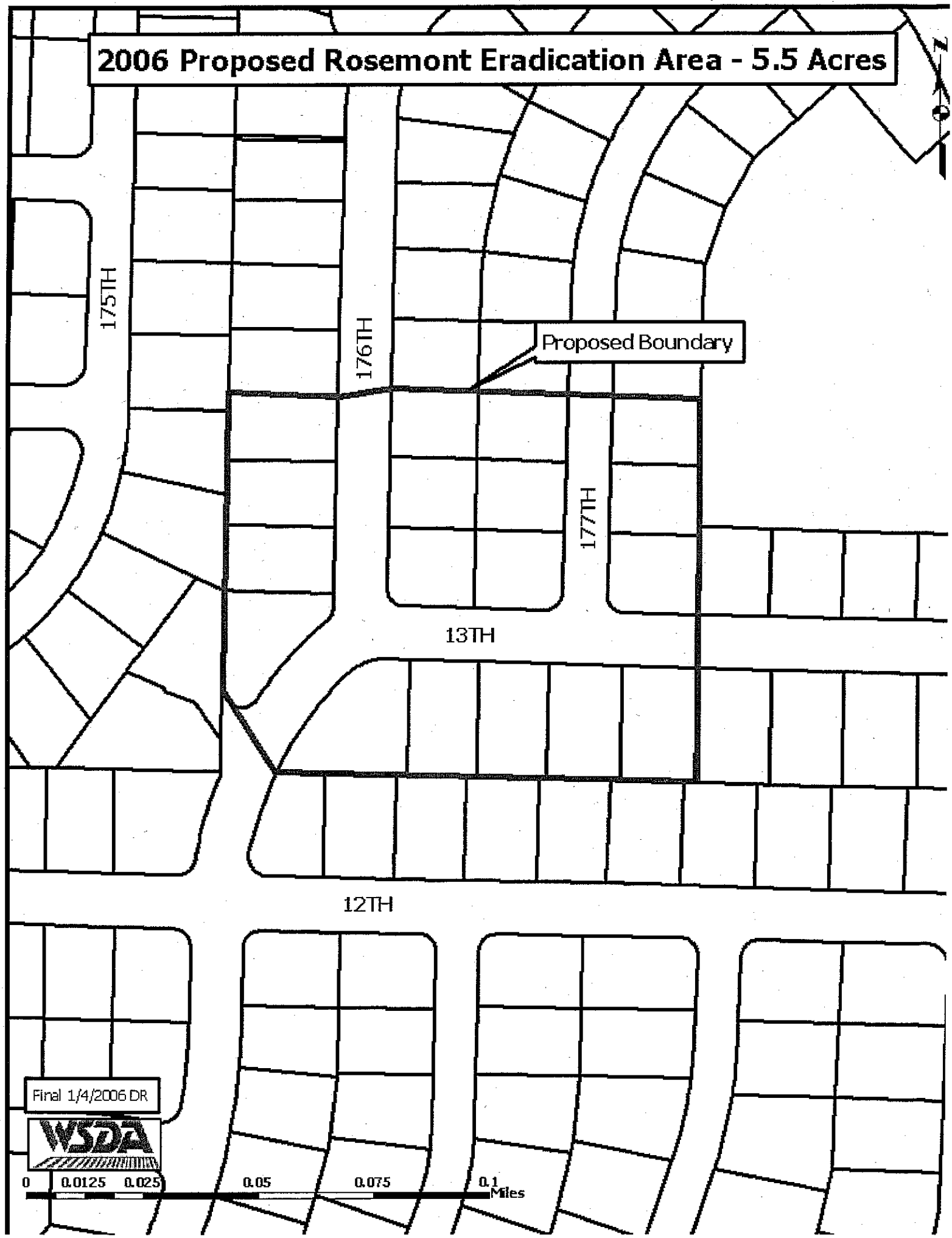
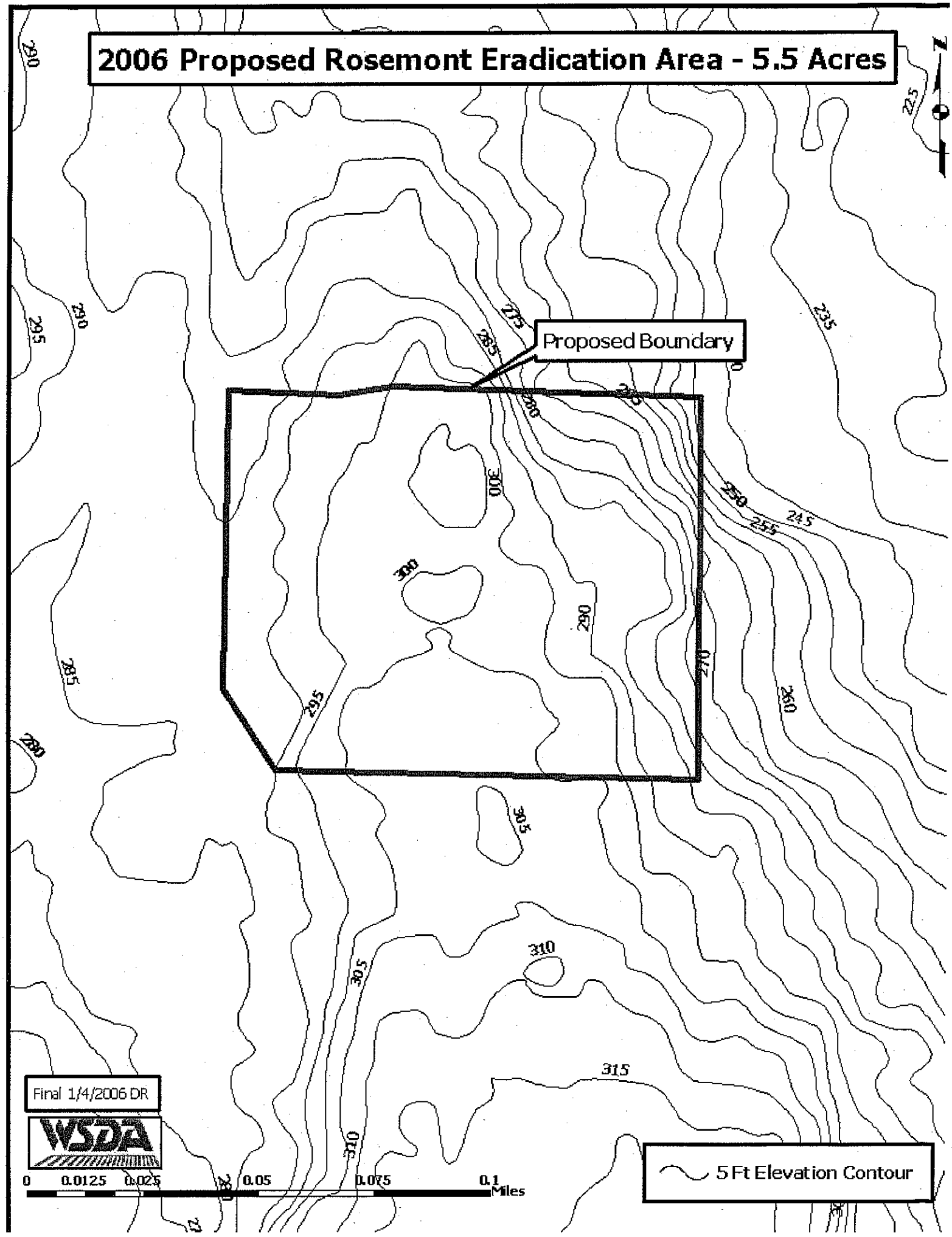
Miles
5 Ft Elevation Contours


2006 Proposed Rosemont Eradication Area - 5.5 Acres
Proposed Boundary
Lake Sammamish
Final 1/4/2006 DR
WSDA
0 0.125 0.25 0.5 0.75 1 Miles


2006 Proposed Rosemont Eradication Area - 5.5 Acres
N
175TH
176TH
177TH
Proposed Boundary
13TH
12TH
Final 1/4/2006 DR
WSDA
0
0.0125
0.025
0.05
0.075
0.1
Miles


2006 Proposed Rosemont Eradication Area - 5.5 Acres
Proposed Boundary
N
Final 1/4/2006 DR
WSDA
0 0.0125 0.025 0.05 0.075 0.1 Miles
5 Ft Elevation Contour

APPENDIX D

Letters Received Through Interagency Consultation Concerning Threatened, Endangered, and Sensitive Species and Habitats

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: 600 Capitol Way N • Olympia, WA 98501-1091 • (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building • 1111 Washington Street SE • Olympia, WA

February 3, 2006

Mr. Chad Phillips
Washington State Department of Agriculture
Post Office Box 42560
Olympia, WA 98504-2560

Dear Mr. Phillips:

This letter is in response to your December 29, 2005 request to review our butterfly records for the Washington State Department of Agriculture (WSDA) proposed 2006 gypsy moth (*Lymantria dispar*) eradication. We have reviewed our butterfly data and evaluated site habitat conditions for the proposed Madrona (Madison) and Rosemont treatment areas. According to your request letter, the proposed Madrona (Madison) treatment area is approximately 100 acres and located in T25N R4E S28; and the Rosemont treatment area is approximately 5.5 acres and located in T25N R5E S25.

We have reviewed our butterfly records and used aerial photos to evaluate local landscape and site habitat conditions at each of the treatment areas for their potential to support rare, state candidate or state listed butterflies. We found no butterfly species of concern records in the immediate proposed *Bacillus thuringiensis* var. *kurstaki* (Btk) application areas or within a 5-mile radius of the areas. Both areas are highly urbanized and vegetation conditions at and near these sites make it very unlikely that they could support rare lepidopterans.

We are generally cautious about the use of Btk, due to the potential for impacting local non-target lepidopterans, particularly low-dispersing species that are isolated or patchily distributed. However, given the habitat conditions present at the proposed treatment sites, it is unlikely that such species inhabit these areas. Direct effects on non-target lepidopterans and any associated indirect effects on non-target vertebrates are likely to be minimal and short-term as the application areas are small and habitat within the areas is similar to the surrounding landscape, factors that support lepidopteran recolonization. We recognize the importance and support early eradication of gypsy moth when populations become established in Washington. We encourage WSDA's participation in ongoing research to develop effective gypsy moth treatment methods that are less harmful to non-target Lepidoptera.

I hope this information is helpful. If you have any further questions, please contact me at 360-902-2496.

Sincerely,

Ann E. Potter

Ann E. Potter, Wildlife Biologist
Wildlife Diversity Division

AEP:aep

cc: Lora Leschner

WASHINGTON STATE DEPARTMENT OF
Natural Resources

DOUG SUTHERLAND
Commissioner of Public Lands

January 12, 2006

Chad Phillips
Department of Agriculture
3939 Cleveland Ave SE
Olympia WA 98501

SUBJECT: Gypsy Moth Eradication Projects, King County: Madrona & Rosemont (T25N R04E S28; T25N R05E S25)

We've searched the Natural Heritage Information System for information on significant natural features in your project areas. Currently, we have no records for rare plants or high quality native ecosystems in the vicinity of your projects.

The information provided by the Washington Natural Heritage Program is based solely on existing information in the database. In the absence of field inventories, we cannot state whether or not a given site contains high quality ecosystems or rare plant species; there may be significant natural features in your study area of which we are not aware.

The Washington Natural Heritage Program is responsible for information on the state's rare plants as well as high quality ecosystems. For information on animal species of concern, please contact Priority Habitats and Species, Washington Department of Fish and Wildlife, 600 Capitol Way N, Olympia WA 98501-1091, or by phone (360) 902-2543.

Please visit our internet website at http://www.dnr.wa.gov/nhp for more information. Lists of rare plants and their status, rare plant fact sheets, as well as rare plant survey guidelines are available for download from the site. Please feel free to call me at (360) 902-1667 if you have any questions, or by e-mail at sandra.moody@wadnr.gov.

Sincerely,

Sandy Swope Moody

Sandy Swope Moody, Environmental Review Coordinator
Washington Natural Heritage Program

Asset Management & Protection Division, PO Box 47014, Olympia WA 98504-7014
FAX 360-902-1789

APPENDIX E

Standard Operating Procedures

WASHINGTON STATE DEPARTMENT OF AGRICULTURE

STANDARD OPERATING PROCEDURES
2006 Gypsy Moth Eradication Project

1. The health and safety of the public, employees of the contractor, and employees of the Washington State Department of Agriculture will be the first concern in implementing the project.

2. Mixing and application of the insecticide will be done only by an appropriately licensed applicator and will be done only under the supervision of a Washington State Department of Agriculture treatment site monitor.

3. The insecticide will be applied according to label directions.

4. Residents in the affected eradication area will be notified of the projected dates and times of insecticide applications through direct mailings, open house presentations, and press releases. Additionally, a manned 1-800 hotline will be established to address further resident concerns, comments, and project suggestions. Recommendations concerning health and welfare issues will be included in public outreach efforts.

5. The project will commence at the appropriate stage of leaf and/or larval development.

6. Weather conditions, particularly wind, will play the largest role in determining when an effective treatment can be made. In the event of rainfall before spray has had sufficient time to adhere to the foliage, a re-treatment may be necessary.

7. Spill control kits will be on site and readily available during all applications.

8. Treatments will not occur when wind speed exceeds 10 miles/hour.

9. Hydraulic apparatus pressures will be limited to that necessary to obtain thorough coverage to the tops of the tallest trees within the treatment area.

APPENDIX F

Product Labels & Material Safety Data Sheets

Valent BioSciences

Foray® 48B

Biological Insecticide

Flowable Concentrate

ACTIVE INGREDIENT:

Bacillus thuringiensis, subsp. *kurstaki*, strain *ABTS-351*, fermentation solids and solubles	17.19%
OTHER INGREDIENTS	82.81%
TOTAL	100.00%

Potency: 10,600 Cabbage Looper Units (CLU/mg) of product (equivalent to 48 billion CLU/GAL).

The % active ingredient does not indicate product performance and potency measurements are not federally standardized.

EPA Reg. No. 73049-46

EPA Est. No. 33762-IA-001 List No. 60178

KEEP OUT OF REACH OF CHILDREN
CAUTION

1.0	FIRST AID
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-315-9819 (24 hours) for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-323-9597.

2.0 PRECAUTIONARY STATEMENTS

2.1 HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Causes moderate eye irritation. Avoid contact with skin, eyes, open wounds or clothing. Wash thoroughly with soap and water after handling.

2.2 Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

2.3 Agricultural Use Requirements:

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

2.4 User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

2.5 Environmental Hazards

Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

3.0 DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

4.0 DIRECTIONS FOR USE BOOKLET

Apply this product only through aerial application.

5.0 AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:

- Coveralls
- Waterproof gloves
- Shoes plus socks

6.0 NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

7.0 APPLICATION

Foray 48B may be only applied by aerial equipment undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected. The amount of water needed per acre will depend upon crop size, weather, spray equipment, and local experience.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator and the grower/treatment coordinator are responsible for considering all of these factors when making decisions.

8.0 HANDLING & MIXING

Foray 48B may be applied undiluted, but the operator must ensure that the bulk quantity is well agitated and homogenous. When Foray 48B is shipped by bulk tankers, and transferred via a 'closed-loop' mixing/loading system, the material is measured by passing through in-line flow meters directly into the aircraft, minimizing exposure to ground handling personnel.

In a similar manner, smaller containers of Foray 48B are also to be used with a 'closed-loop' mixing/loading system to minimize the potential for accidental spills and exposure of ground handling personnel.

If dilution with water is needed for full crop coverage, fill tank with approximately ¾ of the water required for dilution. Begin agitation and pump Foray 48B into the water while maintaining continuous agitation. Agitate as necessary to maintain suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours.

When applying a diluted spray mixture, the use of a spreader-sticker approved for use on growing crops will improve the weather-fastness of the spray deposits. The spray adjuvant is to be added to the tank after the Foray 48B has been added, and before the final volume of water is added to complete the mixture. Reduce or momentarily halt tank agitation and then add the required amount of adjuvant to the diluted mix. You may use your 'closed-loop' system to siphon the required quantity of adjuvant or you may pour the adjuvant into the top hatch of the tank. Once added, close tank opening, and resume agitation; add the rest of the water to complete the spray mix.

Combinations with commonly used spray tank adjuvants are generally not deleterious to Foray 48B, if the mix is used promptly. Before mixing in the spray tank, the testing of physical compatibility by mixing all components in a small container in proportionate quantities will identify possible problems. Checking with an adjuvant supplier for advice on spray adjuvants that are compatible with biological pesticides such as Foray 48B, will help avoid incompatibilities.

9.0 SPRAY VOLUMES

Aerial Application: Use appropriate amount of Foray 48B in aerial equipment undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected. In the western U.S. 5-10 gallons per acre is the normal minimum; in the eastern regions a minimum of 2-3 gallons is normally used. The minimum amount of water needed per acre will depend upon crop size, weather conditions, spray equipment used and local experience.

10.0 GENERAL AGRICULTURAL USE INSTRUCTIONS

Foray 48B is a biological insecticide for the control of lepidopterous larvae. It contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray 48B must be ingested by the larvae to be effective. For consistent control, apply at first sign of newly hatched larvae (1st and 2nd instar larvae). Susceptible larvae that ingest Foray 48B cease feeding within a few hours and die within 2-5 days.

Foray 48B may be applied up to and on the day of harvest.

For maximum effectiveness follow the instructions listed below:

Monitor fields to detect early infestations.

Apply Foray 48B when eggs start hatching and larvae are small (early instars) and before significant crop damage occurs. Larvae must be actively feeding to be affected.

Repeat applications every 3 to 14 days to maintain control and protect new plant growth. Factors affecting spray interval include rate of plant growth, weather conditions, and reinfestation. Monitor populations of pests and beneficials to determine proper timing of applications.

Under conditions of heavy pest pressures or when large worms are present use the higher rate, shorten the application interval, and/or improve spray coverage to enhance control. When these conditions are present, greater control can be achieved by a contact insecticide.

Thorough coverage is essential for optimum performance.

10.1 Application Rates

Crop	Pests	Rate[1] (oz./acre)	Dosage[1] (BIU/acre)
Forests, Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Seed Orchards, Ornamental Fruit, Nut and Citrus Trees[2]	Gypsy Moth & Asian Gypsy Moth, Elm Spanworm	21-107	8-40
	Spruce Budworm, Browntail Moth, Douglas Fir Tussock Moth, Coneworm, Buck Moth	21-80	8-30
	Tussock Moths, Pine Butterfly, Bagworm, Leafrollers, Tortrix, Mimosa Webworm, Tent Caterpillar, Jackpine Budworm, Blackheaded Budworm, Saddled Prominent, Saddleback Caterpillar, Eastern and Western Hemlock Looper, Orangestriped Oakworm, Satin Moth	16-43	6-16
	Redhumped Caterpillars, Spring and Fall Cankerworm, California Oakworm, Fall Webworm	11-21	4-8

Special Instructions

[1] Use the higher recommended rates on advanced larval stages or under high density larval populations.

[2] In treating Gypsy Moth and Asian Gypsy Moth infected trees and shrubs in urban, rural, and semi-rural areas, exposure of non-target vegetation including, but not limited to, native and ornamental species and food or feed crops is permitted.

This product can be mixed and used with other pesticides only in accordance with the most restrictive of label limitations and precautions. This product cannot be mixed with any product containing a label prohibition against such mixing. No label dosage rates may be exceeded.

11.0 DIRECTIONS FOR USE FOR NON-AGRICULTURAL APPLICATIONS

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climactic modification and being grown in ornamental gardens or parks, or on golf courses or lawns and grounds.

Not for use on trees being grown for sale or other commercial use, or for commercial seed production, or for the production of timber or wood products, or for research purposes except wide-area public pest control programs sponsored by government entities, such as mosquito abatement, gypsy moth control, and Mediterranean fruit fly eradication.

Foray 48B contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray 48B is a stomach poison and is effective against lepidopterous larvae. After ingestion, larvae stop feeding within hours and die 2-5 days later. Maximum activity is exhibited against early instar larvae. Foray 48B is to be used for aerial application.

Foray 48B is used with a 'closed-loop' mixing/loading system that will minimize the potential for accidental spills and exposure of ground handling personnel. If dilution with water is needed for full crop coverage, fill tank with approximately ¾ of the water required for dilution. Begin agitation and pump Foray 48B into the water while maintaining continuous agitation. Agitate as necessary to maintain suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours.

11.1 Application

Aerial Application: Foray 48B may be applied aerially, either alone or diluted with water at the dosages shown in the application rates table. Spray volumes of 32-128 ounces per acre give optimum coverage. Best results are expected when Foray 48B is applied to dry foliage.

For smaller spray volumes mix the proper number of teaspoons of Foray 48B from the following chart to attain the desired rates:

If the rate is:	Add this amount per gallon of mix:
0.5 pts./acre	½ teaspoon
1.0 pts./acre	1 teaspoon
1.5 pts./acre	1 ½ teaspoons
2.0 pts./acre	2 teaspoons
3.0 pts./acre	3 teaspoons
4.0 pts./acre	4 teaspoons

12.0 STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal of waste.

Storage: Store in a cool, dry place. Keep containers tightly closed when not in use. Store in temperatures above freezing and below 32°C (90°F).

Pesticide Disposal: Pesticide waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility in accordance with federal and local regulations.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

13.0 NOTICE OF WARRANTY

Seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning the use of this product other than as indicated on the label. User assumes all risks of use, storage or handling not in strict accordance with accompanying directions.

VALENT BIOSCIENCES® CORPORATION
870 TECHNOLOGY WAY
LIBERTYVILLE, IL 60048—800-323-9597

04-4824/R4

 VID 7.14.05

Foray® 48B

ISSUED 06/14/01

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL NAME: Foray® 48B - Not For Use in Canada
EPA Registration No. 73049-46
List Number: 60175 * 60178 * 60179 * 60180
MANUFACTURER: Valent BioSciences Corporation
870 Technology Way, Suite 100
Libertyville, Illinois 60048
EMERGENCY TELEPHONE NUMBERS
Emergency Health or Spill:
Outside the United States: 1-651-632-6184
Within the United States: 1-877-315-9819

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME: Bacillus thuringiensis, var. kurstaki
CAS/RTECS NUMBERS: 68038-71-1, N/A
OSHA-PEL
8HR TWA: N/L
STEL: N/L
CEILING: N/L
ACGIH-TLV
8HR TWA: N/L
STEL: N/L
CEILING: N/L
OTHER LIMITS
8HR TWA: N/A
STEL: N/A
CEILING: N/A
INGREDIENT NAME: Inert ingredients - identity withheld as a Trade Secret
CAS/RTECS NUMBERS: N/A, N/A
OSHA-PEL
8HR TWA: N/L
STEL: N/L
CEILING: N/L
ACGIH-TLV
8HR TWA: N/L
STEL: N/L
CEILING: N/L
OTHER LIMITS
8HR TWA: N/A
STEL: N/A
CEILING: N/A
EEC (European Community): N/D
Symbol Designation: N/A
Risk Phrases: N/A
Safety Phrases: S2 Keep out of reach of children. S3 Keep in a cool place. S13 Keep away from food, drink and animal feeding stuffs.

3. HAZARDS INFORMATION

EMERGENCY OVERVIEW: This material may cause transient skin and eye irritation.
ROUTE(S) OF ENTRY:
Skin: No
Inhalation: No
Ingestion: No
INGESTION RATING: None
SKIN ABSORPTION RATING: None
INHALATION RATING: N/D
CORROSIVENESS RATING: None
SKIN CONTACT RATING: None
SKIN SENSITIZATION RATING: N/D
EYE CONTACT RATING: None
TARGET ORGANS: Possibly skin, eyes and respiratory tract
CARCINOGENICITY RATING:
NTP: N/L
IARC: N/L
OSHA: N/L
ACGIH: N/L
None
SIGNS AND SYMPTOMS: N/D. May cause skin, eye, and respiratory irritation.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: N/D

4. FIRST AID MEASURES

EYES: Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
SKIN: Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
INGESTION: Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
INHALATION: Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

5. FIRE FIGHTING PROCEDURES

FLASH POINT: N/D
FLASH POINT METHOD: N/D
LOWER EXPLOSIVE LIMIT(%): N/D
UPPER EXPLOSIVE LIMIT(%): N/D
AUTOIGNITION TEMPERATURE: N/D
FIRE & EXPLOSION HAZARDS: N/D
EXTINGUISHING MEDIA: Use appropriate medium for the underlying cause of the fire.
FIRE FIGHTING INSTRUCTIONS: Wear protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

SPILL OR RELEASE PROCEDURES: Recover product and place in an appropriate container for disposal. Ventilate and wash the spill area.

7. HANDLING AND STORAGE

HANDLING: Avoid dust generation and provide room ventilation during handling.
STORAGE: Store in a cool, dry place. Keep containers tightly closed when not in use. Store in temperatures above freezing and below 32 C (90 F).
SPECIAL PRECAUTIONS: Wash thoroughly with soap and water after handling.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use local exhaust
RESPIRATORY PROTECTION: Air purifying respirator with dust/mist filter (N95), if necessary.
SKIN PROTECTION: Impervious.
EYE PROTECTION: Goggles.
OTHER PROTECTION: Wear tyvek coveralls if contact may occur.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE: Light brown suspension
ODOR: Pungent, bacterial
BOILING POINT: N/D
MELTING/FREEZING POINT: N/D
VAPOR PRESSURE (mm Hg): N/D
VAPOR DENSITY (Air=1): N/D
EVAPORATION RATE: N/D
BULK DENSITY: 1.12-1.2 g/cm3
SPECIFIC GRAVITY: N/D
SOLUBILITY: Readily mixable with water
pH: 4.1-4.8 as a 10% solution in water
VISCOSITY: N/D

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Not chemically reactive.
INCOMPATIBILITIES: Alkalinity inactivates product.
HAZARDOUS DECOMPOSITION PRODUCTS: Not known to occur.
HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION

ORAL TOXICITY: N/D. LD50 > 5000 mg/kg in rats for a similar formulation. EPA Category IV.
DERMAL TOXICITY: N/D. LD50 > 2500 mg/kg in rabbits for a similar formulation. EPA Category III.
INHALATION TOXICITY: N/D. A similar formulation was not lethal in an inhalation study at the maximum achievable concentration of 6.81 mg/L. EPA Category IV.
CORROSIVENESS: N/D. A similar formulation was not corrosive.
DERMAL IRRITATION: N/D. A similar formulation had slight skin reactions up to 24 hrs after treatment. EPA Category IV.
OCULAR IRRITATION: N/D. A similar formulation was mildly irritating, which was reversible within 7 days. EPA Category III.
DERMAL SENSITIZATION: N/D
SPECIAL TARGET ORGAN EFFECTS: N/D
CARCINOGENICITY INFORMATION: N/D

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: Studies on non-targets have been performed without identifying any organisms at risk. The following species have been included in the testing. Mammals (rats, rabbits), Freshwater aquatic invertebrate (Daphnia Magna, Rainbow Trout), Birds (Mallard Duck, Bobwhite), Non-target insects (Green Lacewing Larvae, Hymenopteran Pedibus Foveolatus, Ladybird Beetles, Honey Bee).

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS: Dispose of product in accordance with federal, state and local regulations.

14. TRANSPORTATION INFORMATION

DOT
STATUS: Not Regulated
PROPER SHIPPING NAME: N/D
HAZARD CLASS: N/D
UN NUMBER: N/D
PACKING GROUP: N/D
REPORTABLE QUANTITY: N/D
IATA/ICA0
STATUS: Not Regulated
PROPER SHIPPING NAME: N/D
HAZARD CLASS: N/D
UN NUMBER: N/D
PACKING GROUP: N/D
REPORTABLE QUANTITY: N/D
IMO
STATUS: Not Regulated
PROPER SHIPPING NAME: N/D
HAZARD CLASS: N/D
UN NUMBER: N/D
PACKING GROUP: N/D
REPORTABLE QUANTITY: N/D
FLASH POINT: N/D

15. REGULATORY INFORMATION

TSCA STATUS: Exempt
CERCLA STATUS: N/D
SARA STATUS: N/D
RCRA STATUS: N/D
PROP 65 (CA): N/D

16. OTHER INFORMATION

LEGEND:
N/A = Not Applicable
N/D = Not Determined
N/L = Not Listed
L = Listed
C = Ceiling
S = Short-term
(R) = Registered Trademark of Valent BioSciences
(TM) = Registered Trademark of Valent BioSciences
The information and recommendations contained herein are based upon tests believed to be reliable. However, Valent BioSciences does not guarantee their accuracy or completeness nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose. Adjustment to conform with actual conditions of usage may be required. Valent BioSciences assumes no responsibility for results obtained or for incidental or consequential damages arising from the use of these data. No freedom from

infringement of any patent, copyright or trademark is to be inferred.

Valent BioSciences

Foray® XG

Biological Insecticide

Flowable Concentrate

For Urban, Home and Garden Use

ACTIVE INGREDIENT:	
Bacillus thuringiensis, subsp. *kurstaki*, strain *ABTS-351*, fermentation solids and solubles	17.19%
OTHER INGREDIENTS	82.81%
TOTAL	100.00%

POTENCY: 10,600 Cabbage Looper Units (CLU/mg) of product (equivalent to 48 billion CLU/GAL).

The % active ingredient does not indicate product performance and potency measurements are not federally standardized.

EPA Reg. No. 73049-46

EPA Est. No. 33762-IA-001 List No. 60178

KEEP OUT OF REACH OF CHILDREN
CAUTION

1.0	FIRST AID
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-315-9819 (24 hours) for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-323-9597.	

2.0 PRECAUTIONARY STATEMENTS

2.1 HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Causes moderate eye irritation. Avoid contact with skin, eyes, open wounds or clothing. Wash thoroughly with soap and water after handling.

2.2 Personal Protective Equipment (PPE)

Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Waterproof gloves
- Shoes plus socks

2.3 Non-Agricultural Use Requirements:

As a general precaution, when exposed to potentially high concentrations of living microbial products such as this, wear a dust particle mask when mixing or applying this product.

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

2.4 User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of the gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

2.5 Environmental Hazards

Do not apply directly to water. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

3.0 DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

4.0 NON-AGRICULTURAL USE REQUIREMENTS

The requirements in this box apply to uses that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.

Exposure of unprotected persons can be mitigated by directed spraying. Spray should be allowed to dry undisturbed.

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climatic modification and being grown in interior plantscapes, ornamental gardens or parks, or on golf courses or lawns and grounds.

Not for use on trees being grown for sale or other commercial use, or for commercial seed production, or for the production of timber or wood products, or for research purposes except wide-area public pest control programs sponsored by government entities, such as mosquito abatement, gypsy moth control, and Mediterranean fruit fly eradication.

Foray XG contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray XG is a stomach poison and is effective against lepidopterous larvae. After ingestion, larvae stop feeding within hours and die 2-5 days later. Maximum activity is exhibited against early instar larvae. Before use, shake or stir the product. Add some water to the tank mix, pour the required amount of Foray XG into the tank and then add the remaining amount of water to obtain the proper mix ratio. Agitate as necessary to maintain the suspension. Use the diluted mix within 72 hours.

Ground Application

Use an adequate amount of tank mix to obtain thorough coverage without excessive run off. Use the indicated per acre dosages of Foray XG in up to the following amounts of water:

High-volume hydraulic sprayers	100 gallons
Mist blowers	10 gallons

5.0 APPLICATION

Foray XG may be applied by ground, undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected. The amount of water needed per acre will depend upon crop size, weather, spray equipment, and local experience.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator and the grower/treatment coordinator are responsible for considering all of these factors when making decisions.

6.0 MIXING

Shake or stir Foray XG before use. If dilution is desired, fill spray or mixing tank half of the desired water. Begin agitation and pour Foray XG into water while maintaining continuous agitation. Add other spray material (if any) and balance of water. Agitate as necessary to maintain suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours.

To improve weather-fastness of the spray deposits for hard to wet crops, such as cole crops, use a spreader-sticker approved for use on growing crops. Combinations with commonly used spray tank adjuvants are generally not deleterious to Foray XG, if the mix is used promptly. Before mixing in the spray tank, the testing of physical compatibility by mixing all components in a small container in proportionate quantities will identify possible problems. Checking with an adjuvant supplier for advice on spray adjuvants that are compatible with biological pesticides such as Foray XG, will help avoid incompatibilities.

7.0 SPRAY VOLUMES

Ground Application: Use indicated amount of Foray XG in ground equipment with quantities of water sufficient to provide thorough coverage of plant parts to be protected. The amount of water needed per acre will depend upon crop size, weather conditions, spray equipment used and local experience.

8.0 GENERAL AGRICULTURAL USE INSTRUCTIONS

Foray XG is a biological insecticide for the control of lepidopterous larvae. It contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray XG must be ingested by the larvae to be effective. For consistent control, apply at first sign of newly hatched larvae (1st and 2nd instar larvae). Susceptible larvae that ingest Foray XG cease feeding within a few hours and die within 2-5 days.

Foray XG may be applied up to and on the day of harvest.

For maximum effectiveness follow the instructions listed below:

Monitor to detect early infestations.

Apply Foray XG when eggs start hatching and larvae are small (early instars) and before significant crop damage occurs. Larvae must be actively feeding to be affected.

Repeat applications every 3 to 14 days to maintain control and protect new plant growth. Factors affecting spray interval include rate of plant growth, weather conditions, and reinfestation. Monitor populations of pests and beneficials to determine proper timing of applications.

Under conditions of heavy pest pressures or when large worms are present use the higher rate, shorten the application interval, and/or improve spray coverage to enhance control. When these conditions are present, a contact insecticide can enhance control.

Thorough coverage is essential for optimum performance. Ground applicators equipped with directed drop nozzles can improve coverage.

8.1 Application Rates

Crop	Pests	Rate[1] (oz./1000 ft^2)
Forests and Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Seed Orchards, Ornamental Fruit, Nut and Citrus Trees[2]	Gypsy Moth & Asian Gypsy Moth, Elm Spanworm	0.5-2.5
	Spruce Budworm, Browntail Moth, Douglas Fir Tussock Moth, Coneworm, Buck Moth	0.5-1.9
	Tussock Moths, Pine Butterfly, Bagworm, Leafrollers, Tortrix, Mimosa Webworm, Tent Caterpillar, Jackpine Budworm, Blackheaded Budworm, Saddled Prominent, Saddleback Caterpillar, Eastern and Western Hemlock Looper, Orangestriped Oakworm, Satin Moth	0.3-1.0
	Redhumped Caterpillars, Spring and Fall Cankerworm, California Oakworm, Fall Webworm	0.25-0.5
Fruiting Vegetables such as: Eggplant, Peppers, Tomatoes	Imported Cabbageworm, Diamondback Moth, Green Cloverworm	0.3-0.5
	Hornworms	0.15-1.0
	Tomato Fruitworm (Heliothis), Variegated Cutworm, Saltmarsh Caterpillar, Loopers	0.5-1.0
	Armyworms*	0.5-1.8
	European Corn Borer	1.0-1.3
Small Fruit and Berries such as: Blackberries, Blueberries, Currants, Raspberries, Strawberries, Cranberries	Gypsy Moth & Asian Gypsy Moth, Blueberry Leafroller, Loopers, Fruittree Leafroller, Grape Berry Moth, Oblique Banded Leafroller, Achema Sphinx Moth (Hornworm)	0.5-1.0
	Armyworms*	0.5-1.8
Brassica (Cole) Vegetables such as: Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Collards, Kohlrabi	Hornworms	0.15-1.0
	Webworms, Loopers, Cutworms, Saltmarsh Caterpillar, Omnivorous Leafroller	0.5-1.0
	Diamondback Moth, Imported Cabbageworm, Green Cloverworm	0.3-1.0
	Armyworms*	0.5-1.8
	European Corn Borer	1.0-1.3
Ornamentals, Flowers, Bedding Plants	Armyworms*	0.5-1.8
	Azalea Moth, Diamondback Moth, Ello Moth (Hornworm), Io Moth, Loopers, Oleander Moth, Omnivorous Leafroller, Omnivorous Looper, Tobacco Budworm	0.3-0.5
Greenhouse and Outdoor Nursery Crops such as: Flowers, Brassica, Fruiting Groups, Herbs, and Leafy Vegetables	Armyworms*	0.5-1.8
	Heliothis spp, Loopers	0.3-0.5

Special Instructions

* Armyworm Control: Foray XG may be used to control small armyworms (first and second instar) when populations are light and full coverage sprays are applied. Repeat treatment as necessary. If late instar larvae or heavy populations are present, greater control can be achieved by adding a contact insecticide.

[1]Use the higher rates on advanced larval stages or under high density larval populations.

[2]In treating Gypsy Moth and Asian Gypsy Moth infected trees and shrubs in urban, rural, and semi-rural areas, exposure of non-target vegetation including, but not limited to, native and ornamental species and food or feed crops is permitted.

This product can be mixed and used with other pesticides only in accordance with the most restrictive of label limitations and precautions. This product cannot be mixed with any product containing a label prohibition against such mixing. No label dosage rates may be exceeded.

For smaller spray volumes mix the proper number of teaspoons of Foray XG from the following chart to attain the desired rates:

If the rate is:	Add this amount per gallon of mix:
0.15 oz./1000 ft.^{2}	½ teaspoon
0.3 oz./1000 ft.^{2}	1 teaspoon
0.5 oz./1000 ft.^{2}	1½ teaspoons
1.0 oz./1000 ft.^{2}	3 teaspoons
1.3 oz./1000 ft.^{2}	4 teaspoons
1.8 oz./1000 ft.^{2}	5½ teaspoons

9.0 STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal of waste.

Pesticide Storage: Store in a cool, dry place. Keep containers tightly closed when not in use. Store in temperatures above freezing and below 32°C (90°F).

Pesticide Disposal: Pesticide waste resulting from the use of this product may be disposed of on site or at an approved waste disposal facility in accordance with federal and local regulations.

Container Disposal: Triple rinse (or equivalent). Then offer for recycling or reconditioning or puncture and dispose of in a sanitary landfill or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

Home Garden Use Disposal Instructions

Securely wrap original container in several layers of newspaper and discard in trash.

10.0 NOTICE OF WARRANTY

Seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning the use of this product other than as indicated on the label. User assumes all risks of use, storage or handling not in strict accordance with accompanying directions.

VALENT BIOSCIENCES® CORPORATION
870 TECHNOLOGY WAY
LIBERTYVILLE, IL 60048—800-323-9597

04-4825/R1

FORAY® XG

MSDS# BIO-0009C
ISSUED 01/31/05

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL NAME: Foray® XG
EPA Reg. No.: 73049-46
Code Number: 11046, 12280, 34296
List Number: 60178, 60179, 60180
SYNONYMS:
Biobit® XL
DiPel 48A
Bactospeine XL
Foray 48BA
Foray 48B
MANUFACTURER:
Valent BioSciences Corporation
870 Technology Way, Suite 100
Libertyville, Illinois 60048
EMERGENCY TELEPHONE NUMBERS
Emergency Health or Spill:
Outside the United States: 651-632-6184
Within the United States: 877-315-9819

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME: Bacillus thuringiensis, var. kurstaki
CONCENTRATION: 17.19%
CAS NUMBER: 68038-71-1
OSHA-PEL
8HR TWA: N/L
STEL: N/L
CEILING: N/L
ACGIH-TLV
8HR TWA: N/L
STEL: N/L
CEILING: N/L
OTHER LIMITS
8HR TWA: N/A
STEL: N/A
CEILING: N/A
INGREDIENT NAME: Inert/Other ingredients - Proprietary Information
CONCENTRATION: 82.81%
CAS NUMBER: N/A
OSHA-PEL
8HR TWA: N/L
STEL: N/L
CEILING: N/L
ACGIH-TLV
8HR TWA: N/L
STEL: N/L
CEILING: N/L
OTHER LIMITS
8HR TWA: N/A
STEL: N/A
CEILING: N/A

3. HAZARDS INFORMATION

EMERGENCY OVERVIEW: Product is non-toxic by ingestion, skin contact, or inhalation. May be irritating to skin and eyes.
ROUTE(S) OF ENTRY:
Skin: No
Inhalation: No
Ingestion: No
SKIN CONTACT: Mild irritant
SKIN SENSITIZATION: Possible mild sensitizer (unconfirmed)
EYE CONTACT: Mild irritant
TARGET ORGANS: N/D
CARCINOGENICITY RATING:
NTP: N/L
IARC: N/L
OSHA: N/L
ACGIH: N/L
None
SIGNS AND SYMPTOMS: Direct contact with eyes or skin may cause mild irritation.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: N/D

4. FIRST AID MEASURES

EYES: Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
SKIN: Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
INGESTION: Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.
INHALATION: Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

5. FIRE FIGHTING PROCEDURES

FLASH POINT: N/A (Aqueous suspension)
FLASH POINT METHOD: N/A
LOWER EXPLOSIVE LIMIT(%): N/A
UPPER EXPLOSIVE LIMIT(%): N/A
AUTOIGNITION TEMPERATURE: N/A
FIRE & EXPLOSION HAZARDS: Non-flammable and no explosive properties.
EXTINGUISHING MEDIA: Use appropriate media for underlying cause of fire.
FIRE FIGHTING INSTRUCTIONS: Wear protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

SPILL OR RELEASE PROCEDURES: Recover product and place in an appropriate container for disposal. Ventilate and wash the spill area.

7. HANDLING AND STORAGE

HANDLING: The usual precautions for handling chemicals should be observed.
STORAGE: Store in a closed container in a cool, dry place.
SPECIAL PRECAUTIONS: Wash thoroughly with soap and water after handling. Keep impervious gloves on until all potentially contaminated personal protective equipment is removed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use local exhaust
RESPIRATORY PROTECTION: Not usually required. If necessary, use a dust/mist respirator meeting NIOSH standards of at least N-95, R-95 or P-95.
SKIN PROTECTION: Impervious gloves, clothing to minimize skin contact.
EYE PROTECTION: Not usually required. If necessary, use safety glasses or goggles.
OTHER PROTECTION: Wash thoroughly with soap and water after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE: Light brown aqueous suspension
ODOR: Pungent, musty odor
BOILING POINT: N/D
MELTING/FREEZING POINT: N/D
VAPOR PRESSURE (mm Hg): N/D
VAPOR DENSITY (Air=1): N/D
EVAPORATION RATE: N/D
BULK DENSITY: 1.12-1.2 g/cm3
SPECIFIC GRAVITY: N/D
SOLUBILITY: Readily mixable with water
pH: 4.1-4.8 as a 10% solution in water
VISCOSITY: N/D

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Not chemically reactive.
INCOMPATIBILITIES: Alkalinity inactivates product.
HAZARDOUS DECOMPOSITION PRODUCTS: Not known to occur.
HAZARDOUS POLYMERIZATION: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
ORAL LD50: N/D. > 5,000 mg/kg (rat) for a similar formulation. EPA Toxicity Category IV
DERMAL LD50: N/D. > 2,500 mg/kg (rabbit) for a similar formulation. EPA Toxicity Category III
INHALATION LC50: N/D. In a nose-only inhalation study with rats with a similar formulation, no lethality was observed at the highest attainable aerosol concentration of 6.81 mg/liter for 4 hours.
CORROSIVENESS: N/D. Not expected to have any corrosive properties.
DERMAL IRRITATION: Transient, slight or mild irritation noted in a dermal irritation study with a similar formulation. EPA Toxicity Category IV.
OCULAR IRRITATION: Transient, mild irritation was observed in test animals in a study a similar formulation. EPA Toxicity Category III.
DERMAL SENSITIZATION: N/D. The possibility of mild sensitization exists with this formulation, however, this has not been confirmed by actual experience.
SPECIAL TARGET ORGAN EFFECTS: N/D
CARCINOGENICITY INFORMATION: N/D. None of the components are classified as carcinogens.

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION: Studies on non-targets have been performed without identifying any organisms at risk. The following species have been included in the testing: mammals (rats, rabbits); freshwater aquatic organisms (Daphnia magna, Rainbow Trout); birds (Mallard, Bobwhite); and non-target insects (Green Lacewing larvae, Ladybird Beetles, Honey Bee).

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS: Dispose of product in accordance with federal, state and local regulations.

14. TRANSPORTATION INFORMATION

DOT
STATUS: Not Regulated
PROPER SHIPPING NAME: N/A
HAZARD CLASS: N/A
UN NUMBER: N/A
PACKING GROUP: N/A
REPORTABLE QUANTITY: N/A
IATA/ICAO
STATUS: Not Regulated
PROPER SHIPPING NAME: N/A
HAZARD CLASS: N/A
UN NUMBER: N/A
PACKING GROUP: N/A
REPORTABLE QUANTITY: N/A
IMO
STATUS: Not Regulated
PROPER SHIPPING NAME: N/A
HAZARD CLASS: N/A
UN NUMBER: N/A
PACKING GROUP: N/A
REPORTABLE QUANTITY: N/A
FLASH POINT: N/A

15. REGULATORY INFORMATION

TSCA STATUS: Exempt
CERCLA STATUS: N/D
SARA STATUS: N/D
RCRA STATUS: N/D
PROP 65 (CA): N/D

16. OTHER INFORMATION

REASON FOR ISSUE: Added alternate brand name (synonym) - Foray XG
APPROVAL DATE: 07/20/04
SUPERSEDES DATE: 06/11/04
Note: Combined and Replaced MSDS # BIO-0033 Rev 0.
LEGEND:
N/A = Not Applicable
N/D = Not Determined
N/L = Not Listed
L = Listed
C = Ceiling
S = Short-term
® = Registered Trademark of Valent BioSciences

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VALENT BIOSCIENCES™ CORPORATION
870 Technology Way, Suite 100
Libertyville, IL 60048 - 800-323-9597

July 2004

 VID 1.31.05

Specimen Label

BOND®

SPREADER STICKER
DEPOSITION AID

Principal Functioning Agents:

Synthetic latex and alcohol ethoxylate	55%
Constituents ineffective as spray adjuvant	45%
TOTAL	**100%**

CA Reg. No. 34704-
WA Reg No. 34704-

KEEP OUT OF REACH OF CHILDREN

CAUTION

NET CONTENTS: 1 U.S. GALLON (3.785 L)

Loveland
PRODUCTS INC
PO Box 1286 • Greeley, CO 80632-1286

LPD213WA

CAUTION: Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling. **Personal Protective Equipment:** Wear Long-sleeved shirt and long pants, Socks, Shoes and Gloves.

First Aid:

If on skin or clothing:	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes.
If in eyes:	Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
If swallowed:	Call a poison control center or doctor immediately for treatment advice. Have a person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person.
If inhaled:	Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artifical respiration, preferably by mouth-to-mouth, if possible.

General: BOND is a very efficient sticker for agriculture and can be used in terrestrial or aquatic settings. BOND's adhesion properties increase initial deposition, reduces run-off and secures spray from rain or overhead irrigation. Apply sprays containing BOND at least one hour before an anticipated rain or overhead irrigation. Once the spray has dried, BOND will adhere the pesticides.

Directions for Use: SHAKE WELL BEFORE USE. Fill spray tank 1/2 full with water and begin agitation. Add pesticides as directed by the label while maintaining agitation and continue to fill. After pesticides are thoroughly mixed, continue agitation and add BOND at desired rate. Some pesticides have stated adjuvant use rates. In all cases, the pesticide manufacturer's label should be consulted regarding specific use recommendations and that rate followed. Do not add adjuvant at a level that would exceed 5% of the finished spray volume. For tank mix compatibility concerns, conduct a jar test of the proposed mixture to ensure compatibility of all components. Mix components in the same ratio as the proposed tank mix.

Suggested use rates: The sticking efficiency of BOND varies from pesticide to pesticide, so the usage rate will be associated with the formulation being sprayed.

1 to 2 pints per 100 gallons *OR* 2 to 4 fluid ounces per acre

Rinse tank and nozzles immediately after spraying. Observe the pre-harvest interval on the pesticide label when using BOND. No time limitations apply to non-food crops.

Storage: Store in cool, dry place. Store in original container. Keep tightly closed. Do not reuse empty container.

Disposal: Do not contaminate water, food or feed by storage or disposal. Wastes may be disposed of on-site or at an approved waste disposal facility. Triple rinse (or equivalent) adding rinse water to spray tank. Offer container for recycling or dispose of container in sanitary landfill, or by other procedures approved by appropriate authorities. Recycling decontaminated containers is the best option of container disposal. The Agricultural Container Recycling Council (ACRC) operates the national recycling program. To contact your state and local ACRC recycler visit the ACRC web page at www.acrecycle.org.

WARRANTY DISCLAIMER AND NOTICE

IT IS IMPOSSIBLE TO ELIMINATE ALL RISKS INHERENTLY ASSOCIATED WITH THE USE OF THIS PRODUCT. CROP INJURY, INEFFECTIVENESS, OR OTHER UNINTENDED CONSEQUENCES MAY RESULT DUE TO SUCH FACTORS AS WEATHER CONDITIONS, PRESENCE OR ABSENCE OF OTHER MATERIALS, OR THE MANNER OF USE OR APPLICATION, ALL OF WHICH ARE BEYOND THE CONTROL OF LOVELAND PRODUCTS, INC., THE MANUFACTURER OR SELLER. THE PRODUCTS SOLD TO YOU ARE FURNISHED "AS IS" BY LOVELAND PRODUCTS, INC., THE MANUFACTURER OR SELLER, AND ARE SUBJECT ONLY TO THE MANUFACTURER'S WARRANTIES, IF ANY, WHICH APPEAR ON THE LABELS TO THE PRODUCTS SOLD TO YOU. EXCEPT AS EXPRESSLY PROVIDED HEREIN, LOVELAND PRODUCTS, INC., THE MANUFACTURER OR SELLER MAKES NO WARRANTIES, GUARANTEES, OR REPRESENTATIONS OF ANY KIND TO BUYER OR USER, EITHER EXPRESS OR IMPLIED, OR BY USAGE OF TRADE, STATUTORY OR OTHERWISE, WITH REGARD TO THE PRODUCT SOLD OR USE OF THE PRODUCT, INCLUDING, BUT NOT LIMITED TO, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, USE OR ELIGIBILITY OF THE PRODUCT FOR ANY PARTICULAR TRADE USAGE. EXCEPT AS EXPRESSLY STATED HEREIN, LOVELAND PRODUCTS, INC., THE MANUFACTURER OR SELLER MAKES NO WARRANTY OF RESULTS TO BE OBTAINED BY USE OF THE PRODUCT. BUYER'S OR USER'S EXCLUSIVE REMEDY, AND LOVELAND PRODUCTS, INC'S., THE MANUFACTURER'S OR SELLER'S TOTAL LIABILITY, SHALL BE LIMITED TO DAMAGES NOT EXCEEDING THE COST OF THE PRODUCT. NO AGENT OR EMPLOYEE OF LOVELAND PRODUCTS, INC. OR SELLER IS AUTHORIZED TO AMEND THE TERMS OF THIS WARRANTY DISCLAIMER OR THE PRODUCT'S LABEL OR TO MAKE A REPRESENTATION OR RECOMMENDATION DIFFERENT FROM OR INCONSISTENT WITH THE LABEL OF THIS PRODUCT.

IN NO EVENT SHALL LOVELAND PRODUCTS, INC., THE MANUFACTURER OR SELLER BE LIABLE FOR CONSEQUENTIAL, SPECIAL OR INDIRECT DAMAGES RESULTING FROM THE USE, HANDLING, APPLICATION, STORAGE OR DISPOSAL OF THIS PRODUCT OR FOR DAMAGES IN THE NATURE OF PENALTIES AND THE BUYER AND USER WAIVE ANY RIGHT THEY MAY HAVE TO SUCH DAMAGES.

LPD213WA

MATERIAL SAFETY DATA SHEET

BOND

FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL CHEMTREC - DAY OR NIGHT 1-800-424-9300

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

FORMULATED FOR:

Loveland Industries, Inc.
P.O. Box 1289 • Greeley, CO 80632-1289

24-Hour Emergency Phone: 1-800-424-9300
Medical Emergencies: 1-800-301-7976

PRODUCT NAME: BOND
CHEMICAL NAME: Carboxylated Synthetic Latex (combination of synthetic latex and primary aliphatic oxyalkylated alcohol)
CHEMICAL FAMILY: Mixture of surfactants (liquid detergent)
CA REG. NO.: 36208-50005
MSDS Number: BND-03 **MSDS Revisions:** Sections 9, 11, 15 and 16 **Date Of Issue:** 10/15/03 **Supersedes:** 07/15/03

2. COMPOSITION, INFORMATION ON INGREDIENTS

Chemical Ingredients:	Percentage by Weight:	CAS No.	TLV (Units)
Synthetic Latex	45.00	Mixture	Not established
Primary Aliphatic Oxyalkylated Alcohol	10.00	Mixture	Not established
Inert Ingredients	45.00		

3. HAZARDS IDENTIFICATION SUMMARY

KEEP OUT OF REACH OF CHILDREN. CAUTION. PRIMARY ROUTES OF ENTRY ARE EYE CONTACT AND SKIN CONTACT

This product is a sticking agent with surfactant. This product is a white liquid with mild odor.

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air. If victim has difficulty breathing, seek medical attention.
Eye Contact: Flush eyes with water for 15 minutes; get medical attention.
Skin Contact: Wash with soap and water; remove contaminated clothing. Get medical attention if irritation persists.
Ingestion: First aid is not normally required. If symptoms persist get medical attention.

5. FIRE FIGHTING MEASURES

FLASH POINT (°F/Test Method): >212°F / >100°C (PMCC)
FLAMMABLE LIMITS (LEL & UEL): Not established
EXTINGUISHING MEDIA: Dry chemical or carbon dioxide (CO_2), foam or water spray/fog.
HAZARDOUS COMBUSTION PRODUCTS: Carbon monoxide and/or carbon dioxide
SPECIAL FIRE FIGHTING PROCEDURES: Wear self-contained breathing apparatus and full protective gear.
UNUSUAL FIRE AND EXPLOSION HAZARDS: None.

6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:
Wear appropriate personal protective equipment (refer to Section 8). Pick up the material with absorbent material and place in a container for proper disposal in accordance with local, state and federal regulations.
ENVIRONMENTAL PRECAUTIONS: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

7. HANDLING AND STORAGE

HANDLING: Keep out of reach of children. This material may cause eye and skin irritation. Wash thoroughly after handling.
STORAGE: Keep unused material in original container. Store in a cool dry place. Do not reuse empty container.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Work in well-ventilated area. Local exhaust may be required if working in confined space.
RESPIRATORY PROTECTION: Wear a NIOSH approved air-purifying respirator for pesticide handling if necessary.
EYE PROTECTION: Chemical goggles or face-shield.
SKIN PROTECTION: Wear long sleeved shirt, long pants, shoes and socks.

	OSHA PEL 8 hr TWA	ACGIH TLV-TWA
For product	not listed	not listed

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: White liquid with mild odor.
SPECIFIC GRAVITY (Water= 1): 1.01 g/ml
VAPOR PRESSURE: Not established
PERCENT VOLATILE (by volume): Not established
BULK DENSITY: 8.43 lbs/gal.
BOILING POINT: Not established
EVAPORATION RATE: Not established
SOLUBILITY: Dispersible
pH: 7.4 (1% solution)

Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

10. STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: None known.
INCOMPATIBILITY: Low pH (strong acidic conditions) will cause coagulation. Excessive free metallic ions may cause coagulation.
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide from burning.
HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Oral LD_{50} (rat): > 5000 mg/kg
Eye Irritation (rabbit): Moderate eye irritant
Inhalation LC_{50} (rat): 4.73 mg/L.
Acute Dermal LD_{50} (rabbit): >2000 mg/kg
Skin Irritation (rabbit): Slight skin irritant
Skin Sensitization: Not a sensitizer.
Carcinogenic Potential: Not listed by OSHA, NTP, IARC, and ACGIH as a known human carcinogen

12. ECOLOGICAL INFORMATION

May be toxic to fish and aquatic invertebrates. Guppy: 96 HR LC_{50}: 12.7 mg/L – 96 HR No Effect: 5.8 mg/L. Daphnia Magna: 24 HR EC_{50}: 5.2 mg/L – 24 HR No Effect: 1 mg/L

13. DISPOSAL CONSIDERATIONS

Do not reuse container. Dispose of liquid and contaminated solids in accordance with local, state and federal regulations. (See 40 CFR 268).
Triple rinse (or equivalent) and offer for recycling at an ACRC site or place in trash. Incinerate contaminated solids in accordance with local, state and federal regulations. (See 40 CFR 268).

14. TRANSPORT INFORMATION

DOT Shipping Description: NOT REGULATED BY USDOT.
Freight Classification: ADHESIVES, ADJUVANTS, SPREADERS OR STICKERS (NMFC 4610; CLASS: LTL 60, TL 35)
Consult appropriate ICAO/IATA and IMDG regulations for shipment requirements in the Air and Maritime shipping modes.

15. REGULATORY INFORMATION

NFPA & HMIS Hazard Ratings:

NFPA		HMIS	
2	Health	2	Health
2	Flammability	2	Flammability
0	Instability	0	Reactivity
		H	PPE

0 Least, 1 Slight, 2 Moderate, 3 High, 4 Severe

SARA Hazard Notification/Reporting
SARA Title III Hazard Category:

Immediate	Y	Fire	N	Sudden Release of Pressure	N
Delayed	N	Reactive	N		

Reportable Quantity (RQ) under U.S. CERCLA: Not listed
SARA, Title III, Section 313: Not listed
RCRA Waste Code: Not listed
CA Proposition 65: Not listed

16. OTHER

MSDS STATUS: Sections 9, 11, 15 and 16

PREPARED BY: Registrations and Regulatory Affairs

REVIEWED BY: Environmental/Regulatory Services